

# Psychological Review

EDITED BY

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# THE PSYCHOLOGICAL REVIEW

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## THE PLACE OF INNATE INDIVIDUAL AND SPECIES DIFFERENCES IN A NATURAL-SCIENCE THEORY OF BEHAVIOR

BY CLARK L. HULL

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### INTRODUCTION

The natural-science approach to behavior theory presents two major tasks. The first is to make a satisfactory working analysis of the various behavior processes; this consists in deriving, *i.e.*, deducing, from the primary laws of the system the characteristic observable phenomena of the behavior process in question as displayed by the modal or average organism under given conditions. This is the task which engages the efforts of the traditional academic theorist (4, 6). It leads to attempts to deduce, and thereby explain, such processes as simple discrimination learning, simple trial-and-error learning, complex discrimination learning, compound (chain) trial-and-error learning, the acquisition of skill, rote learning, generalizing abstraction, the evolution of concepts, primary motivation, secondary motivation, the assembly of behavior segments in problem solution, abstract (verbal) reasoning (3, pp. 220, 244), fallacies, rationalizations, delusions—in short, to an analysis of all sorts and varieties of adaptive and maladaptive behavior.

The second major task of a natural-science approach to behavior theory concerns the problem of innate behavioral differences under identical conditions between different species and between the

individuals within a given species. It involves such questions as these: Given two rats with similar antecedent life histories, why can one learn a particular maze more quickly than the other? Why is it that an occasional rat can master the double alternation temporal maze problem, whereas most rats, apparently, will never master it regardless of the amount of training devoted to the task (7, 8)? Why is it that dogs can master certain tasks impossible to rats, that apes can master certain tasks impossible to dogs, and that men can master very many tasks impossible to apes? Why does one of two human individuals with comparable previous environmental influences progress satisfactorily in school while the other is a dismal failure? Why does one individual under given circumstances develop a weak, yielding personality, a second develop an aggressive, overbearing personality, and a third develop a furtive, secretive personality? Such questions could be multiplied almost indefinitely.

Both types of task cry loudly and insistently for completion. But most neglected of all is the relationship between the two approaches. We are accordingly here devoting ourselves briefly to the consideration of this relationship, with special reference to its bearing on

the theory of individual and species differences in behavior potentiality.

One obvious, even commonplace, cause of individual differences in behavior is a difference in the previous histories of the organism involved. Differences in individual histories inevitably result in different sets of habits in each organism and so in different behavior under exactly similar external stimulating conditions. This environmental source of individual behavioral differences is of immense importance and there is no intention here of minimizing it. There is much reason to believe, however, that even if organisms could be subjected to identical environmental conditions from the moment of conception, great differences would still be displayed in the behavior of different species as a whole and in the behavior of the individual organisms of each species. Such differences must presumably be regarded as dependent upon, *i.e.*, derived from, differences in the innate or original nature and constitution of the individual organism. We shall accordingly call them *innate differences*.

#### THE THEORETICAL DILEMMA PRESENTED BY INNATE INDIVIDUAL DIFFERENCES AND ITS FORMAL SOLUTION

At this point in our analysis a critical dilemma emerges. The natural-science theory of behavior being developed by the present author and his associates assumes that all behavior of the individuals of a given species and that of all species of mammals, including man, occurs according to the same set of primary laws. These laws typically take the form of equations. Prediction of the behavior theoretically to be expected under particular conditions is made by substituting quantitative values representing the situation in question in the equations which are statements of the laws. *But if the laws (equations) are*

*the same for all organisms, the equal values corresponding to identical reaction-instigating conditions when substituted in these equations would necessarily produce identical predictions of behavioral outcome for all organisms.* This, of course, amounts to a denial of innate individual and species differences.

The paradox just proposed probably arises in the main from the ambiguity of the notion of identical natural laws. This ambiguity may be clarified by a citation from elementary physics. The law which expresses the distance ( $s$ ) that a body will fall from rest within a certain time ( $t$ ) is given by the equation,

$$s = \frac{1}{2}gt^2.$$

The *form* of the equation represents the law. But nearly all such equations contain one or more of what are known as *empirical constants*, values which must be determined by empirical investigation before the equation can be used in actual prediction. The  $g$  in the above equation is such a constant. Now, it has long been known that  $g$  varies appreciably from one point on the earth to another. For example,  $g$  at Hammerfest is 32.2364 feet, whereas at Madras it is 32.0992 feet and at New York it is 32.1594 feet. But this variation in the value of  $g$  does not change the *general form* of the equation, and so is not regarded as constituting a violation of the generality of the law.

This example of a natural law containing a variable empirical constant paves the way for the statement of the hypothesis which is believed to offer a solution to the paradox presented by the assumption of strict natural primary behavioral laws and the assumption of important innate individual and species differences in behavior potentiality. The hypothesis may be stated very simply: *Innate individual and species differences find expression in the 'empirical con-*



stants' which are essential constituents of the equations expressing the primary and secondary laws of behavior. This is the central point of the present paper.

#### A FORMAL ILLUSTRATION OF THE WORKING OF THE HYPOTHESIS

An example worked out in detail may make clear the meaning of the hypothesis just presented. Though empirical validation is not yet available, there is some *a priori* reason to believe that a close approximation to the discrimination threshold or difference limen ( $DL$ ) of any individual organism (or the mean discrimination threshold for the individuals of a given species) when based upon a large number of distributed trials at the limit of training in simple separate-stimulus-presentation discrimination, is given by the equation (6),

$$DL = \frac{\log \frac{M_E}{M_E - 3\sigma_0}}{h + i} \quad (1)$$

where,

$DL$  is the difference limen as obtained by the method of separate stimulus presentation in j.n.d. units, the latter as determined on a standard group of organisms under conditions of *joint* stimulus presentation (the method ordinarily employed),<sup>1</sup>

<sup>1</sup> In simple *separate-stimulus-presentation* discrimination, the times of the delivery of the stimuli to be discriminated are spaced far enough apart (e.g., twenty-four hours) for the perseverative stimulus trace of the first of the pair to be dissipated before the delivery of the second of the pair. In simple *joint-stimulus-presentation* discrimination, the procedure commonly employed in discrimination experiments, the second stimulus is presented soon enough after the presentation of the first for the stimulus perseveration of the first still to be active in the nervous system when the second occurs. This latter circumstance presents the possibility of an afferent neural interaction effect between the two impulses (4), which presumably favors discrimination. For this reason, the difference limen ( $DL$ ) as

$M_E$  is the magnitude of the excitatory potential of the organism at the point of reinforcement in wats (4, p. 239),

$\sigma_0$  is the standard deviation of the behavioral oscillation function (4, p. 319),

$h$  is the exponent appearing in the equation which represents the generalization of positive habit strength (4, p. 199),

and

$i$  is the exponent appearing in the equation which represents the generalization of extinctive inhibition (4, pp. 264, 283).

In order to show how this equation illustrates the present hypothesis, let it be assumed that we have a standard situation in which  $M_E = 70$  wats,  $h = .01$ ,  $i = .01$ , and  $\sigma_0 = 6$  wats. Substituting these values in equation 1, we have

$$\begin{aligned} DL &= \frac{\log \frac{70}{70 - 3 \times 6}}{.01 + .01} \\ &= \frac{\log \frac{70}{70 - 18}}{.02} \\ &= \frac{\log 1.346}{.02} \\ &= \frac{.12905}{.02} \\ &= 6.45. \end{aligned}$$

determined by separate stimulus presentation will be different from, and presumably considerably greater than, the j.n.d. as determined by joint stimulus presentation. Accordingly in equation 1 the  $DL$  (of separate-stimulus-presentation discrimination) is expressed in terms of the (presumptive) j.n.d. of joint-stimulus-presentation discrimination. This is the reason why in the illustrative computations which follow, the  $DL$  (of separate-stimulus-presentation discrimination) is represented as several times (e.g., 6.45) the size of the j.n.d. as determined by joint-stimulus-presentation discrimination.

This value (6.45) will be taken as the basis of comparison with a succession of other situations in which one empirical constant will be varied at a time.

Suppose, first, that  $M_R$  be increased from 70 wats to 90 wats. We then have

$$\begin{aligned}
 DL &= \frac{\log \frac{90}{90 - 3 \times 6}}{.01 + .01} \\
 &= \frac{\log \frac{90}{90 - 18}}{.02} \\
 &= \frac{\log 1.25}{.02} \\
 &= \frac{.09691}{.02} \\
 &= 4.84.
 \end{aligned}$$

Thus, increasing  $M_R$  from 70 to 90 improves the discrimination by decreasing the discrimination threshold from 6.45 units to 4.84 units. Generalizing on the preceding considerations, we arrive at our first exemplary corollary concerning individual (or species) differences:

I. *Other things equal, in simple separate-stimulus-presentation discrimination by distributed trials, that organism (or species) which has the larger reaction potential will have the finer (smaller) discrimination threshold.*

Suppose, next, that either  $h$  or  $i$  be increased from .01 to .02. We then have

$$\begin{aligned}
 DL &= \frac{\log \frac{70}{70 - 3 \times 6}}{.01 + .02} \\
 &= \frac{\log \frac{70}{70 - 18}}{.03} \\
 &= \frac{\log 1.346}{.03} \\
 &= \frac{.12905}{.03} \\
 &= 4.30.
 \end{aligned}$$

Thus, increasing either  $h$  or  $i$  from .01 to .02 (thereby steepening one or the other gradient of generalization) decreases the reaction threshold from 6.45 to 4.30. Generalizing on the preceding considerations we arrive at our second exemplary corollary concerning individual (or species) differences:

II. *Other things equal, in simple separate-stimulus-presentation discrimination by distributed trials, that organism (or species) which has the steeper excitatory and/or inhibitory generalization gradient will have the finer (smaller) discrimination threshold.*

Finally, let us suppose that the value of  $\sigma_0$  be increased from 6 to 7 wats. We then have

$$\begin{aligned}
 DL &= \frac{\log \frac{70}{70 - 3 \times 7}}{.01 + .01} \\
 &= \frac{\log \frac{70}{70 - 21}}{.02} \\
 &= \frac{\log 1.429}{.02} \\
 &= \frac{.15503}{.02} \\
 &= 7.75.
 \end{aligned}$$

Thus the increase in  $\sigma_0$  from 6 to 7 units increases the discrimination threshold from 6.45 to 7.75. Generalizing on these considerations we arrive at our third exemplary corollary concerning individual (or species) differences:

III. *Other things equal, in simple separate-stimulus-presentation discrimination by distributed trials, that organism (or species) which has the larger standard deviation of oscillatory variability ( $\sigma_0$ ) will have the coarser (larger) discrimination threshold.<sup>2</sup>*

<sup>2</sup> While the present paper was in press, a review of *Principles of Behavior* (4) appeared (*J. genet. Psychol.*, 1944, 65, 3-52), in which it was pointed out that the book contained no

POSSIBLE BEARING OF THE PRESENT  
HYPOTHESIS ON FUTURE RESEARCH

From the three preceding examples we are able to see not only how in general the variation in empirical constants can account for individual differences in an adaptive capacity wholly within the framework of a strict natural-science theory, but specifically how variations in three empirical constants may influence adaptive capacity in simple separate-phase discrimination. Differences in  $M_E$ ,  $h$ ,  $i$ , and  $\sigma_0$  accordingly play the role of *primary* individual differences, whereas the resulting differences in the  $DL$  become *secondary* individual differences. This means that if independent determinations could be made of  $M_E$ ,  $h$ ,  $i$ , and  $\sigma_0$  for a given organism (or species) its discrimination threshold at a particular point on a given stimulus continuum could be calculated directly from equation 1.

At this point we encounter a second paradox. This is that from the analysis of animal behavior in the main (6) there emerges quite unexpectedly the indication for a new approach to the prediction of individual differences in human aptitudes (2, p. 21 ff.). It is only necessary to consider the  $DL$  as the criterion score of an aptitude, and  $M_E$ ,  $h$ ,  $i$ , and  $\sigma_0$  as test scores, to see the relationship to aptitude prediction, though there are significant differences. Equation 1 as an aptitude-prediction formula is radically different from the multiple-regression equation traditionally employed in aptitude prediction (2, p. 457 ff.), and  $M_E$ ,  $h$ ,  $i$ , and  $\sigma_0$  purport at least to be

"capacity laws," i.e., no "principles that relate differences of learning capacity to differences of species, age, and IQ." Actually the principles put forward above embrace not only learning, but the whole field of behavior. It may be added that the present paper has been taken with only minor changes from the manuscript of a book now in preparation (6) which is to be the second volume in the series on behavior theory.

innate tendencies. Thus  $M_E$ ,  $h$ ,  $i$ , and  $\sigma_0$  are closely analogous to the group factors in Spearman's approach to aptitudes, though the present methodology of identifying the 'factors' is also radically different (10) from that employed either by Spearman or by any factor analysis based on correlation. Even so, one factor in our exemplary analysis ( $\sigma_0$ ) corresponds closely to one which Spearman has stressed. Symptomatic of the correspondence is the fact that Spearman has called this factor, 'oscillation' (10, p. 319 ff.).

It is important to note that the present type of analysis may also be applied to differences which take place in the behavior of organisms as the result of drug action and various pathological conditions. Familiar examples of drug action are those of caffeine on the one hand and the bromides on the other. These were investigated to some extent by Pavlov and his pupils (9, pp. 127, 300), but not from the point of view of changes in the empirical behavior constants as here conceived; the latter seems not to have been attempted as yet by anyone.

Another extremely intriguing research possibility would be to ascertain what behavior constants are changed, and in what manner, when individuals pass into mild or violent manic states with the characteristic distractibility, 'flight of ideas,' and so forth. A possible molar cause of the marked lack of adaptive continuity in the behavior of such individuals may be found to lie in a considerably shortened duration in the perseverative stimulus trace (4, p. 42). Another possible molar cause may be that the magnitude of the strictly internal component of the oscillation function (4, pp. 304 ff.) is greatly increased. The research opportunities offered by these theoretico-empirical approaches to psychopathology are believed to be typical of many to be found in this enor-

mously important field. It is not inconceivable that such researches might have considerable practical value by suggesting causal factors and therapeutic procedures.

It is to be regretted that no factual evidence in support either of the central hypothesis of the present paper as to the nature of individual or species differences, or of the soundness of equation 1 can be given at this time. Judging by the author's experience to date, the task of empirically validating quantitative secondary molar behavioral laws (represented by equation 1 above) is very difficult, and the validation of equations representing the primary behavioral laws (and the incidental determination of the values of the empirical constants appearing in these equations) is excessively so. Despite the fact that a program of empirical research directed to this latter end has been in progress in the author's laboratory for more than a year, it must be confessed that not a single empirical constant of the twenty or so contained in his systematic approach to behavior (4; 5, pp. 176-177) has been satisfactorily determined. However, a very promising technique is being developed and we now have renewed hope.

#### SUMMARY

A strict quantitative natural-science approach to the theory of behavior presents a serious dilemma as to the place in it occupied by individual and species differences. This dilemma is easily resolved on a purely formal level by assuming that the *forms* of the equations representing the behavioral laws of both individuals and species are identical, and that the differences between individuals and species will be found in the empirical constants which are essential components of such equations. The validity of this hypothesis would seem to be susceptible to an empirical determination but as yet the necessary experimental work has not been performed. If the

hypothesis should turn out to be true, it is conceivable that it would open up an entirely new approach to the scientific study of the nature of aptitudes and liabilities. If this should occur it would mark a genuine junction between pure and applied psychology, which of late have seemed to be drifting farther and farther apart (1). It might even lead to a situation such that clinical psychologists, aptitude psychologists, psychiatrists, penologists, sociologists, and cultural anthropologists will study attentively the theory of animal behavior as an essential background, at least where research and creative scholarship are contemplated. This would be in accordance with the practice of engineers who now receive training in the basic disciplines of mathematics, physics, and chemistry throughout the most of their academic training.

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# TIME AS A DETERMINANT IN INTEGRATIVE LEARNING<sup>1</sup>

BY O. H. MOWRER AND A. D. ULLMAN

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Each of the three great schools of contemporary psychology has made distinctive contributions to the better understanding of the integrated functioning of living organisms. Gestalt psychology has particularly stressed the view that behavior is always a product of the total psychological situation.<sup>2</sup> From its inception, psychoanalysis has been indirectly concerned with the phenomenon of integration through its antithesis, namely, psychological conflict; and, more recently, analytic writers have dealt increasingly with the 'synthetic functions of the ego,' whereby the competing demands of id, super-ego, and external reality are somehow reconciled (19, 22, 31). Even stimulus-response, or 'objective,' psychology, though preoccupied with a more segmental approach to the study of behavior, has fostered many researches on the 'complex learning processes.'<sup>3</sup>

Yet a basic problem remains unsolved. It is a familiar fact that living organisms sometimes manifest behavior which is chronically *non-integrative*, i.e., behavior which is consistently *more punishing than rewarding*. This fact constitutes a major theoretical paradox and is the outstanding characteristic of neu-

rosis and criminality. The present paper attempts to show that the factor of *time* is of special significance in this connection and that only by taking it into explicit account can the problem of persistent non-integrative behavior be satisfactorily defined and a hopeful way to its theoretical solution indicated.

## I

While stressing 'organization,' 'insight,' 'configuration,' and other integrational concepts, Gestalt psychologists have had little to say about integration *failure*. Perhaps the main reason for this neglect is the fact that writers of the 'wholistic' persuasion tend to regard integration as an automatic consequence of organic maturation, or 'growth,' which can be used as an explanatory device instead of being something which is an outcome of psychological processes and which must itself be studied and explained. For Gestalt writers, integration tends to be an unanalyzable ultimate, without antithesis.<sup>4</sup> This tendency is illustrated by the fact that a well known book in this field (50) lists 25 separate index references to 'configuration' but not one to 'conflict.' A more recent book by another Gestalt writer (49) contains 38 index references to 'organization' but none to 'disorganization' or any equivalent concept. Of the 45 articles reprinted in Tomkins' source book on *Contemporary Psychopathology*

<sup>1</sup> The experimental findings described in this paper were first reported, in abridged form, at the 1942 meeting of the Eastern Psychological Association, Providence, R. I.

<sup>2</sup> See Hopkins (38), Redfield (74), Howells (40), and Smuts (78) for an indication of the widely diverse fields into which Gestalt conceptions of integration have permeated.

<sup>3</sup> See, for example, the chapter by Heron in Moss' *Comparative Psychology* (36). Cf. also the chapters on 'problem solving behavior' and 'thinking' in Woodworth's *Experimental Psychology* (88).

<sup>4</sup> In conversation, Professor George Hartmann has suggested that the antithesis which is probably implicit in Gestalt theory is the Greek contrast between *cosmos* and *chaos*. This, however, is more of a metaphysical than psychological conception, as is the whole-part dichotomy.

(84), only three have a Gestalt, 'organismic,'<sup>5</sup> or 'field theoretical' orientation, and Hunt's recent handbook on *Personality and the Behavior Disorders* (43) has but two such chapters in a total of 35. Goldstein (32) has been much interested in comparing 'ordered' and 'disordered' behavior, but the examples of the latter which he cites, while instructive in their own right, have their origin in cortical damage and hardly give us a theory of integration failure applicable to organisms whose nervous systems are structurally intact. Lewin has used the terms 'dedifferentiation' (55) and 'regression' (56) to characterize non-integrative behavior and has explicitly recognized the problem of conflict (55), but his insistence upon an a-historical, spatial type of analysis seems to the writers to impose serious limitations upon his otherwise very suggestive system.<sup>6</sup> And, despite the statement that "this [Gestalt] viewpoint has theoretical importance for psychodynamic theory as well as practical importance for psychotherapy" (8, p. 147), Brown's *Psychodynamics of Abnormal Behavior* is actually highly eclectic and draws far more tellingly from psychoanalysis than from *Gestalttheorie*.

In short, we need not multiply evidence to show that Gestalt psychology has not particularly concerned itself with problems of abnormal, non-integra-

tive behavior and is probably not inherently well suited to this task.<sup>7</sup>

The psychoanalytic movement has stemmed from the historic discovery of Breuer and Freud that neurotic symptoms have not only symbolic meaning, but also dynamic 'purpose,' i.e., are motivated and satisfying (wish-fulfilling). This arresting hypothesis stands in direct opposition to the common perception of only the painful and embarrassing consequences of neurotic behavior, but the pragmatic usefulness of this view has gradually won for it widespread support. However, the hypothesis that abnormal behavior always involves some degree of reward, as well as punishment, does not solve the *quantitative* aspect of the problem. If the over-all gain, or satisfaction, resulting from a given form of behavior exceeds the over-all loss, or pain, such behavior would seem to be conforming very acceptably to the so-called pleasure principle and would scarcely be deemed 'abnormal.' But if behavior consistently results in less gain than loss, it is almost certain not to be judged 'normal' and is very troublesome, both practically and theoretically. Analytic writers are generally agreed that repression is a *sine qua non* of neurosis, but since the pleasure principle is supposed to operate no less in the unconscious than in the conscious regions of the personality, the question remains: How is it that any pattern of action, if predominantly pain-

<sup>5</sup> To the extent that 'organismic' means the psycho-somatic or psycho-biological unity of living organisms and thus ends the mind-body dichotomy it is taken for granted by all modern scientific schools of psychology and psychiatry. It is only when living organisms are said always to 'act as totalities'—thus logically excluding the possibility of conflict—that 'organismic' takes on the distinctive connotations with which it is here used.

<sup>6</sup> However, some of the incidental observations he has made concerning 'psychological life-time' and 'levels of reality and irreality' (55, 57) are highly instructive and will be referred to later.

<sup>7</sup> For Gestalt-like approaches to the problem of non-integration, see Werner (85) on 'rigidity,' Korzybski (51) on 'loss of conditionality,' and Kretchevsky (52) on impairment of 'behavior plasticity.' Under the heading of 'disturbances of integration,' Angyal introduces the concept of 'bionegativity' which he defines as "a personality constellation in which one or more part processes disturb the total function of the organism" (5, p. 329). This is an acceptable description of non-integration, but it is hardly an explanation or theory.

ful in its consequences, may nevertheless persist indefinitely?

In his later years, Freud attempted to solve this dilemma in a most extraordinary manner. He began his attack by asking if there are any known types of behavior which do indeed conform to the common conception of neurotic phenomena which had prevailed before his and Breuer's original discovery, *i.e.*, types of behavior which are not merely predominantly, but *exclusively*, painful. The recurrent anxiety dreams of persons suffering from traumatic neuroses, the seemingly pleasureless repetitive play sometimes seen in children, and the painful 'transference' of analytic therapy seemed to Freud, upon reexamination, to fill this description.<sup>8</sup> He therefore felt justified in postulating, what he had already begun to suspect on the basis of the commoner neurotic symptoms, namely, "that there really exists in psychic life a repetition-compulsion, which goes beyond the pleasure-principle [and which is] more primitive, more instinctual than the pleasure-principle which is displaced by it" (23, pp. 24-25).

This positing of a repetition compulsion which supersedes the pleasure principle did indeed resolve the paradox of behavior which has consequences consistently more punishing than rewarding, but it did so at great cost: it was a repudiation, or at least a subordination, of the one principle which had previously dominated all psychoanalytic thought and theory. As Kubie remarks:

This concept presents a more revolutionary challenge to accepted psychoanalytic premises than any which Freud, or even any dissenter, has heretofore formulated. Implicitly, by denying to the pleasure principle a central and determining position in

the dynamics of human behavior, it strikes at the very foundations of the libido theory and of our basic conceptions of the dynamics of neurosis (53, p. 390).

At first stunned and bewildered by such a pronouncement on the part of a trusted leader, most analysts were slow to react to the full implications of Freud's repetition-compulsion (and its correlative speculations concerning the death-instinct); but a rising tide of skepticism and dissent is now evident, of which the following comment, again by Kubie, is representative:

Thus we are finally forced to conclude that there is neither any need nor any evidence for a 'repetition compulsion'—and that the phrase itself has become a mere descriptive epithet, a psycho-analytic version of the word 'habit,' that the virtue of the concept is purely descriptive, and that it can never be called upon . . . to explain a single neurotic phenomenon (53, p. 402).

However, in disavowing the repetition-compulsion, one does not solve the problem which prompted Freud to advance this hypothesis; instead, one merely revives it. Today there is more and more discussion in analytic circles of 'ego psychology' which contains certain intimations of a solution to this problem along more acceptable lines. But as a distinguished American analyst has recently pointed out, much of the current work on ego psychology is still far from satisfactory from a scientific standpoint in that it tends to personify *the ego* instead of deriving systematic principles whereby the so-called ego, or integrative, functions are carried out.<sup>9</sup>

<sup>9</sup> T. French, *The Integration of Social Behavior*. Paper read before the Boston Psychoanalytic Society, January 21, 1944. We feel that the same criticism is to some extent also applicable to a recent paper by G. W. Allport (3). However, we are in complete agreement with Allport that the concept of 'ego,' vague as it is, covers an important and much neglected area in contemporary academic psychology.

<sup>8</sup> Elsewhere (27) Freud has discussed the 'economic problem of masochism,' but it apparently played no direct part in his thinking in the present connection.

Later we shall return to some of the most promising suggestions which have been advanced in this connection, but in the meantime it will be instructive to review briefly the efforts which have been made to deal with the problem of persistently non-integrative behavior in terms of stimulus-response psychology.

In making repetition, or 'exercise,' the unitary law of learning, William James accepted the logically necessary implication: namely, that "not only is it the right thing at the right time that we must involuntarily do, but the wrong thing also, if it be an habitual thing" (47, p. 114). For such a theory, the persistence of 'wrong,' *i.e.*, non-integrative, behavior is no problem. Since each repetition of a response is assumed to strengthen the tendency to repeat that response, any response, regardless of its consequences, tends automatically to become more and more strongly fixated. Habits are thus like avalanches, which, once started, cannot be stopped. Or, one might say, habit formation is a kind of perpetual motion, with constant acceleration. But such a theory leaves unexplained the not unusual case in which behavior with mainly undesirable consequences, instead of being reinforced by each occurrence, does indeed get eliminated, stopped. In order to account for this latter phenomenon, James had to abandon what he termed the scientific, or 'mechanical,' frame of reference and invoke 'the will.' This, he said, was the force which transcends the law of habit, by means of which it was supposedly possible (if 'the will'—compare current references to 'the ego'—were 'strong' enough) to restrain a 'wrong' or 'disadvantageous' habit until 'disuse' had had an opportunity to obliterate the hypothetical neural pathways which 'use' had originally established.

It was an obvious advance when Thorndike (80), a few years later, formulated the Law of Effect as a supple-

ment to James' Law of Exercise. In fact, subsequent developments have shown that of the two, the supplement is actually the more fundamental, since increasing evidence suggests that the mere repetition of a response, as distinct from its effects, probably has little or no significance in determining its fate (69, 81). However, Thorndike's Law of Effect runs squarely into the paradox of persistent non-integrative behavior. Thorndike divided his Law of Effect into two sub-principles which we may refer to as the Principles of Reward, according to which responses with pleasurable consequences get 'stamped in,' and the Principle of Punishment, according to which responses with painful consequences get 'stamped out.' By implication, a given act should be 'stamped in' or 'stamped out' in direct proportion to the extent to which its consequences are predominantly rewarding or predominantly punishing. Without emendation, such a theory obviously cannot account for the 'stamping in' of responses whose consequences are *predominantly punishing*.

The impasse to which the Law of Effect thus leads is precisely the one which Freud encountered in trying to explain non-integrative behavior in terms of the pleasure-principle.<sup>10</sup> What

<sup>10</sup> French (18) and Mowrer (66) have both previously commented on the parallelism between Thorndike's Law of Effect and Freud's pleasure-principle. However, without a word of explanation this parallelism is likely to be disputed, or at least misunderstood. The psychological theory of 'pleasure' which is best known in our culture today is that of the English hedonists, or Utilitarians, who held that: "Every pleasure is *prima facie* good, and ought to be pursued. Every pain is *prima facie* evil, and ought to be avoided" (6, p. 59). Thus, the pursuit of pleasure and the avoidance of pain becomes, in Bentham's words, the 'two sovereign masters' of mankind (7). Although we know that Thorndike read and was impressed by Bentham and, in his earlier writings, even used a somewhat similar terminology, he has recently stressed the difference be-



contemporary writers, both analytic and academic, tend to do in practice is to invoke the Law of Effect (pleasure-principle) to account for integrative behavior but to resort to the Law of Exercise ('repetition compulsion')<sup>11</sup> to

tween hedonism and the Law of Effect: "The general consequences of the action of reward are very different from those assumed by the pleasure-pain psychology of Bentham, Spencer, Bain, or their followers. Human beings are not propelled by pleasure and repelled by pain in any such uniform ways as these hedonists assumed" (82, p. 39). Instead, says Thorndike, living organisms are 'propelled' by motives (drives, 'pain' in the most general sense), and it is the reduction of these sources of discomfort that provides pleasure.

Superficially, it may seem that Freud's pleasure-principle is pure hedonism, and there are indeed passages which seem to imply as much; but Freud's more considered formulations make the same distinction as does Thorndike. Thus, says Freud, "we take it for granted that the course of mental processes is automatically regulated by 'the pleasure-principle': that is to say, we believe that any given process originates in an unpleasant state of tension and thereupon determines for itself such a path that its ultimate issue coincides with a relaxation of this tension, *i.e.*, with avoidance of 'pain' or with production of pleasure" (23, p. 1). At a later date, in discussing the psychoanalytic theory of drives ('instincts'), Freud says, "The source is a state of excitation, within the body, and its aim is to remove the excitation . . . which is experienced as satisfaction" (28, pp. 132-133).

It is clear, therefore, that Thorndike's Law of Effect and Freud's pleasure-principle both differ from hedonism in essentially the same manner: for the hedonists, pleasure was a motive, whereas for Freud and Thorndike it is always 'pain' or 'tension' which is the motive, and pleasure is a product—one might almost say by-product—of drive-reduction or problem-solution. It is true that Thorndike has made a more explicit connection between the Law of Effect and 'learning' than Freud ever proposed, but if we translate 'determines for itself such a path that its ultimate issue, etc.' as 'learning,' which one can reasonably do, we see that such a connection was at least implicit in Freud's formulations.

<sup>11</sup> The similarity between the Law of Exercise and the repetition compulsion has been noted by Kubie, who says: "The 'repetition compulsion' is here given a power in human

explain instances of non-integrative behavior.

It is interesting to find that psychoanalysis started with the pleasure-principle and later turned to the repetition compulsion, whereas learning theory started with the Law of Exercise and was later forced to posit the Law of Effect. Superficially, this criss-crossing of two great streams of psychological thought might be interpreted as proving that both these 'laws' are really necessary for an adequate and comprehensive theory of behavior. But we submit instead the thesis that to have one principle to account for one set of phenomena which fit this principle and another principle to account for another set of phenomena which do not, is to rely on a vicious convenience. If we cannot make either of these principles do the complete job it ought to do, we should discard them both and start again, along entirely new and more promising lines.

It now appears that the solution to

affairs directly comparable to the power attributed to 'habit' in popular lay psychologizing. It is looked upon as an explanation beyond which one need seek no further" (53, p. 395). And Hendrick similarly remarks, "The repetition compulsion includes the traditional concept of habit, but Freud's emphasis on its unconscious dynamics, its presence from the very earliest experience of infancy, and its relationship to instinct theory, involves more than the renaming of a general observation" (53, p. 103). It is interesting to note that although the 'repetition compulsion' appeared relatively late in Freud's writings, it was actually present in nascent form in the much earlier notion of 'fixation.' A somewhat similar conception of behavior-perpetuation without a dynamic element of satisfaction is involved in Allport's first formulation of what he has termed 'functional autonomy' (1, but see also 2). Later we shall see that an integrated personality does indeed have a kind of 'autonomy' which gives it a certain limited immunity to the Law of Effect; but this will be found to differ significantly from the Law of Exercise, the repetition-compulsion, and functional autonomy as originally put forward.

this problem is to discard one of these principles altogether and revise and expand the other in such a way as to make it really adequate to its task. Both clinical and experimental evidence is now available which seems to argue definitively against the Law of Exercise and the 'repetition compulsion.' At the same time other data are at hand which make it possible to extend the Law of Effect in such a manner as to resolve the paradox of persistent non-integrative behavior. This we shall attempt to do in the next section.

## II

It is not necessary to trace recent developments concerning the problem of whether there is both a 'law of reward' and a 'law of punishment,' or only a 'law of reward' from which the facts subsumed under the 'law of punishment' can be derived. This problem has been considered elsewhere (67, 70). But there are two well-attested empirical phenomena which are of the utmost significance in this connection. Extensive experimental evidence as well as common experience show that if a response is immediately followed by a rewarding state of affairs (drive reduction), the tendency for that response to occur in the same problem-situation in the future is reinforced more than if there is a temporal delay between the occurrence of the response and the reward. This functional relationship has been termed the 'gradient of reinforcement' (75, 42, 37, 63). It is also well known, though less fully documented experimentally, that if a response is immediately followed by a punishing state of affairs (drive increase), the kinesthetic and other stimuli resulting from the making of this response become more strongly conditioned to the emotional response of anxiety than if there is a delay between the occurrence of the response and the punishment (37, 48).

Any thoroughgoing analysis of the problem of persistent non-integrative behavior must, we believe, start with these two facts. From these facts it follows that the consequences of a given act determine the future of that act not only in terms of what may be called their quantitative aspects, but also in terms of their *temporal pattern*. In other words, if an act has two consequences—the one rewarding and the other punishing—which would be strictly equal if simultaneous, the influence of those consequences upon later performances of that act will vary depending upon the *order* in which they occur. If the punishing consequence comes first and the rewarding one later, the difference between the inhibiting and the reinforcing effects will be in favor of the inhibition. But if the rewarding consequence comes first and the punishing one later, the difference will be in favor of the reinforcement.

In either instance the resulting behavior would be non-integrative. Logically, two events which are equivalent if simultaneous should still be equivalent if successive; but, psychologically, this is not the case. In our example, if the reward comes first, the tendency to perform the act in question will be more reinforced than inhibited, and if the punishment comes first, the act will be more inhibited than reinforced. Whereas, from a strictly 'reasonable,' integrative standpoint, the inhibitory and the reinforcing effects should exactly cancel each other.

One can think of this problem in terms of a physical analogy. If two weights of equal mass are placed at equal distances from the fulcrum of a lever, they will, of course, exactly counter-balance each other; but if either of these objectively 'equal' weights is placed further from the fulcrum than the other, it has a mechanical advantage which enables it to tip the balance

in its favor. In the functional sense, the weights are no longer 'equal,' and a state of 'disbalance' results.<sup>12</sup> In this physical analogy, *spatial distance* from the fulcrum provides the advantage, whereas in the psychological situation it is *temporal nearness* to the rewarding or punishing state of affairs that is the deciding factor. In this sense the analogy is not an entirely happy one, but it will suffice to illustrate the point that in a dynamic (conflict) situation, the outcome is determined not alone by the absolute magnitude of the causal forces but also by their relational (in the one case spatial, in the other case temporal) properties.<sup>13</sup>

At this point the two following objections should be briefly considered:

1. It may seem that an analysis such as the foregoing one is too 'mechanical' and that it does not sufficiently recognize the extent to which normal adult human beings are able to make 'reasoned judgments' which neatly transcend the behavioral dilemmas into which the temporal factors just discussed would seem to lead. We acknowledge that normal

adult human beings do possess truly remarkable powers in this respect, but we feel that the present analysis has the double advantage of calling attention to the basic problem which human 'rationality' has to solve and of providing a useful avenue of approach to a clearer understanding of just how these capacities are mediated. Most clinical writers agree that it is precisely the mechanical, rigid, stereotyped, inflexible, irrational aspect of non-integrative behavior that distinguishes it most sharply from integrative behavior. It is scarcely a disadvantage if an analysis of the problem of non-integrative behavior accommodates this fact.

2. The other most likely criticism of this line of thought is that it is unrealistically simple and that an experimental verification is a waste of time. We do not wish to under-estimate the complexity of human or even infra-human behavior. Later we shall, in fact, stress some of the complications that arise even at the experimental level. We are also aware that actual human conflicts do not consist of neatly arranged pairs of contending forces but may involve a multitude of motivations, as shown by the mechanism of 'over-determination' in dreams, neurotic symptoms, and even in the normal decisions of daily life. Our excuse for deliberately simplifying our experimental situation and for using subjects which are incapable of many of the behavioral complexities found in man is that we wish merely to demonstrate a principle, in its clearest and least ambiguous form. Once agreed on the principle, we should be prepared to return to the level of actual human behavior, with improved understanding and discernment.

### III

The apparatus used in this study has been described in detail elsewhere (68).

<sup>12</sup> It is scarcely necessary to remind the reader that not only can one weight in this manner 'outweigh' another of equal mass; by the same principle, a small weight can balance or even out-balance an objectively very much heavier one. The same seems to be true of the psychological effects of reward and punishment. . . . Since the above was written we have discovered Magoun's engaging little book, *Balanced Personality* (60), in which the same physical analogy is used. However, it is enlivened by picturing 'Dottie Desire' on one end, 'Connie Conscience' on the other, with 'William Wisdom' in the middle, ready to lean now one way, now the other, as a means of keeping a proper equilibrium between these two opposing forces. This dramatization of the Freudian conception of Id, Super-ego, and Ego may be compared with the conflict situation described in the following section.

<sup>13</sup> This, we suppose, is a form of 'field theory,' but one which is to us much less nebulous than many of the formulations which currently pass under this heading.

Here we need mention only that it consisted of a box-like compartment, 33 inches long, 20 inches high, and 6 inches deep, with a glass front and a floor consisting of a metal grill from which electric shock could be administered. Food, in the form of a small cylindrical pellet of Purina Dog Chow ( $\frac{1}{4}$  inch long and  $\frac{1}{8}$  inch in diameter), could be made available in a small trough at the left end of the apparatus.

The subjects were 21 black female rats, five months of age. After each animal had been reduced to 15 per cent below normal body weight by living on a restricted diet over a period of several days, it was put into the apparatus and taught to go to the food trough whenever a buzzer was sounded. The buzzer lasted for two seconds, and just as it terminated a pellet of food was dropped into the trough. Buzzer and food were presented at regular minute intervals, 20 times per day over a period of five days. All animals soon learned to run to the food trough as soon as the buzzer sounded, in much the same way that a dog or cat learns to come when called. By the end of these 100 preliminary training trials, the average time elapsing between the appearance of food and its being seized and eaten was less than one second.

At the end of this preliminary training, the experimenters made a 'rule,' which was that the subjects were henceforth not to touch the food for a period of *three seconds* after it appeared in the trough. One may think of this as a kind of rat 'etiquette,' according to which it was not 'polite' to eat until the prescribed length of time had elapsed. We could not, of course, 'tell' our subjects about this rule, but we established conditions which were calculated to teach it to them. On the day immediately following the five-day training period just described, each of the 21 rats was put into the apparatus as usual; but the con-

ditions were now such that if a rat took the food within the forbidden three-second interval, it received two seconds of shock (.06 milliamperes) from the floor of the apparatus. In other words, the rats were 'punished' for eating within the tabu period but were free to eat, without punishment, if they waited a minimum of three seconds after the food appeared.

The problem which the animals had to solve was how to get the food without, however, also getting the shock. The essential aspects of this problem have already been described, but two additional conditions must now be mentioned. At the end of the preliminary training procedure, before the experiment proper started, the 21 subjects were randomly divided into three equal groups, which will hereafter be designated as the 3-sec. Group, the 6-sec. Group, and the 12-sec. Group. All of these groups were treated in exactly the same way except in the matter of *how soon* the shock was administered as a result of an animal's violating the rule against taking a pellet with the three-second tabu period. In the case of the 3-sec. Group, the punishment came immediately after the tabu period ended, *i.e.*, 3 seconds after the food was presented. For the 6-sec. Group, the punishment came 3 seconds after the tabu period had ended, *i.e.*, 6 seconds after the food was presented. And for the 12-sec. Group, punishment came 9 seconds after the tabu period had ended, *i.e.*, 12 seconds after the food was presented. This arrangement allowed us to make a systematic comparison of the degree of difficulty encountered by our subjects in solving the problem of how to get the food without getting shocked as a function of the length of time by which the punishment for eating within the tabu period was delayed.

The other special condition to be mentioned is that with all three groups, the



# TIME AS DETERMINANT IN INTEGRATIVE LEARNING

buzzer, which, during the preliminary training, had the single function of calling the animals to the food trough and which terminated just as the food appeared, now remained on, in all cases, until the end of the tabu period. If the animal did not take the pellet during this period, the buzzer was then turned off; this meant that its termination served as an 'all-clear' signal. On the other hand, if an animal erred and took the food during the tabu period, the buzzer remained on throughout this period *and* until the shock was administered, *i.e.*, the buzzer stayed on until the shock had been applied for two seconds. The buzzer and shock then went off together. We shall later explain the reason for this particular use of the buzzer, but suffice it now to note that during the second phase of the experiment the buzzer had a more complicated 'sign function' than during the preliminary training period. It formerly meant 'come and get the food'; but in

the second stage of the experiment, it meant "the food is in the trough but don't take it until the buzzer goes off." If this warning was violated, the buzzer remained on until the punishment had been applied.

In the phase of this experiment which has just been described, each animal received ten trials per day over a ten-day period. The interval between successive trials was regularly 60 seconds.

There were three obviously possible ways in which an animal could react in this experiment: (1) it could take the food within the danger period and get shocked; (2) it could avoid the shock by not eating at all; (3) it could wait the three seconds and then eat, thereby avoiding the shock but getting the food. Without attempting at the moment to justify these terms, we shall refer to the first of these patterns of behavior as 'delinquent,' the second as 'neurotic,' and the third as 'normal.' We shall also characterize the first and the second of

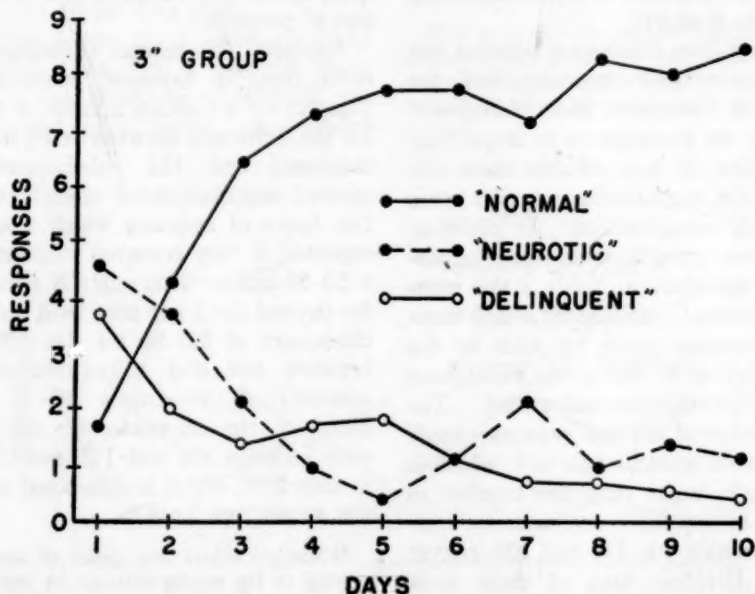


FIG. 1. Curves showing the average incidence of three different patterns of response made by the seven rats comprising the 3-sec. Group. Each animal was given ten trials a day, and the experiment lasted ten days.

TABLE 1  
INCIDENCE OF THREE DIFFERENT KINDS OF RESPONSES MADE BY EACH OF  
THE SEVEN RATS IN THE 3-SEC. GROUP

Animal	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	Totals
'Normal' responses	69	74	77	68	54	51	76	469
'Delinq.' responses	15	21	9	21	12	30	15	123
'Neurotic' responses	16	5	14	11	34	19	9	108
Totals	100	100	100	100	100	100	100	700

these patterns as 'non-integrative,' and the third as 'integrative.'

Figure 1 shows the average incidence of these three patterns of behavior in the 3-sec. Group throughout the ten-day experimental period. On the first day, 'neurotic' and 'delinquent' responses predominated, but from the third day on 'normal' responses were increasingly in the ascendancy. In other words, the seven animals comprising this group learned to deal with this conflict situation in a predominantly *integrative* manner.

Although the differences between the curve for 'normal' responses and the curves for 'neurotic' and 'delinquent' responses are conspicuous to inspection, the question of how reliable these differences are, statistically, presents some interesting complications. In order to make these complications more apparent, we reproduce in Table 1 the number of 'normal,' 'delinquent,' and 'neurotic' responses made by each of the seven subjects in this group throughout the ten-day experimental period. The total number of 'normal' responses made by all seven animals was 469, which is very much larger than the number of either 'delinquent' or 'neurotic' responses, which was 123 and 108, respectively. Dividing each of these three totals by 7, it would be a simple matter to obtain the corresponding averages; and it then might seem appropriate to

apply the familiar *t*-test to the differences between these averages. If these averages represented the performances of three separate groups of subjects, the *t*-test would, of course, be in order; but the values shown in Table 1 and in Fig. 1 represent performances which have a *reciprocal* relation to each other and are for a single group of subjects. These facts violate the assumptions on which the valid use of the *t*-test is based. Fortunately the method of chi-square is quite specifically suited to deal with this sort of problem.

Applying the general chi-square formula (see, for example, Snedecor, 79, Chapter I), we obtain a value of 202.22 for the difference between 469 ('normal' response) and 123 ('delinquent' response) and the number of each of these two types of response which would be expected if they occurred randomly, on a 50-50 basis. This value is significant far beyond the 1 per cent level, as is the chi-square of 225.86 for the difference between 469 and 108 ('neurotic' responses) on a strictly 50-50 ratio. However, the chi-square for the difference between 108 and 123 and 'chance' is only 0.97, which is significant at only the 40 per cent level.<sup>14</sup>

<sup>14</sup> The chi-square test could, of course, be applied to the results obtained on any of the ten days of experimentation, as well as to the over-all results. But since the course of learning is so clear from the curves shown in Fig. 1, this procedure does not seem necessary.

Figure 2 shows comparable data for the seven animals in the 6-sec. Group. Here the general picture is much the same as in Fig. 1, except that these animals made relatively more 'delinquent' and fewer 'normal' responses. The integrative solution to this type of problem is obviously harder in this situation, where punishment is delayed 3 seconds, than in the situation in which it comes immediately after the tabu period. The chi-square for the difference between 381 (total number of 'normal' responses made by all seven animals) and 172 (total number of 'delinquent' responses) and the number of such responses which would be expected on the basis of a 50-50 hypothesis is 78.99. The chi-square for the difference between 381 and 147 (total 'neurotic' responses) and the hypothetical expectation is 103.70. Both of these values are significant well beyond the 1 per cent level. The chi-square for 172 and 147, on the same hypothesis, is 1.96, which is significant only at the 18 per cent level.

In Fig. 3 the trend noted in going from Fig. 1 to Fig. 2 becomes more striking: the incidence of 'normal' responses not only starts but remains

lower than the incidence of 'delinquent' responses. Under the conditions represented by the curves in Fig. 3, *i.e.*, with the punishment for violating the tabu delayed 9 seconds after the tabu period has ended, non-integrative behavior is the rule rather than the exception and becomes increasingly so with successive trials. It will be noted, however, that the non-integrative pattern is of the 'delinquent' rather than of the 'neurotic' type. As a matter of fact, the animals in this 12-sec. Group actually made fewer 'neurotic' responses than did those in either the 3-sec. or the 6-sec. Group.<sup>15</sup>

This 12-sec. Group made a total of 208 'normal' and 421 'delinquent' responses. These numbers depart from what would be expected on the basis of a 50-50 hypothesis by a chi-square of 72.12. The chi-square for 208 and 71 ('neurotic' responses) is 67.27, and for 421 and 71 is 448.98. All these values are significant beyond the 1 per cent level.

<sup>15</sup> In all groups the number of 'neurotic' responses could almost certainly have been increased and the number of 'delinquent' responses decreased by using a more intense punishment.

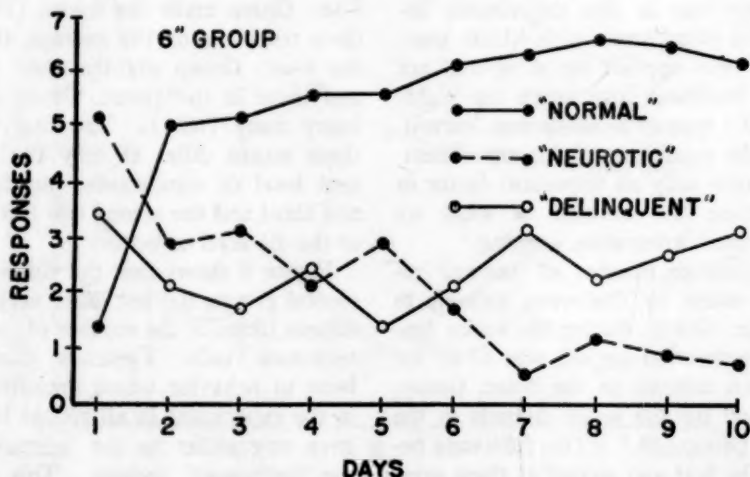


FIG. 2. Average incidence of 'normal,' 'delinquent,' and 'neurotic' responses made by the seven animals comprising the 6-sec. Group.

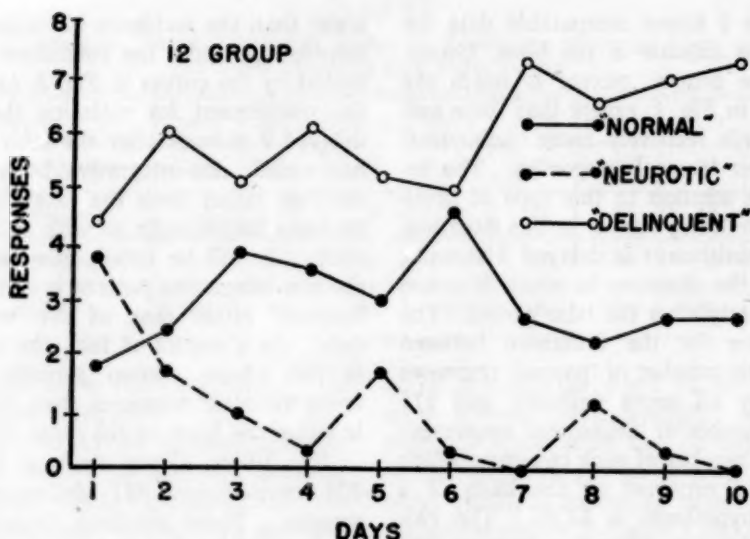


FIG. 3. Average incidence of 'normal,' 'delinquent,' and 'neurotic' responses made by the seven animals comprising the 12-sec. Group. Note that in this group 'delinquent' responses predominated throughout the experiment.

Figures 4, 5, and 6 show the same nine curves as have just been discussed, but here they are so arranged as to make possible a more direct comparison of the number of 'normal,' 'neurotic,' and 'delinquent' responses made by each of the three experimental groups.

Figure 4 shows how close a connection there was in this experiment between the promptness with which 'punishment' was applied for a 'wrong' act and the readiness with which the 'right' ('normal') type of behavior was learned. Under the conditions of this experiment, time is obviously an important factor in determining the outcome of what we have termed 'integrative learning.'

The average number of 'normal' responses made by the seven animals in the 3-sec. Group, during the entire ten-day experimental period, was 67.0; for the seven animals in the 6-sec. Group, 54.3; and for the seven animals in the 12-sec. Group, 29.7. The difference between the first and second of these averages has a  $t$ -value of 1.755 and is reliable at only the 10 per cent level; but

the differences between the second and third and between the first and third have  $t$ -values of 3.219 and 6.016, respectively, both of which are reliable at the 1 per cent level or better.

Figure 5 shows the relative incidence of the 'delinquent' pattern of response in all three groups. The animals in the 3-sec. Group made the fewest (17.6) of these responses on the average, those in the 6-sec. Group slightly more (24.6), and those in the 12-sec. Group a great many more (60.1). The first two of these means differ at only the 25 per cent level of significance, but the first and third and the second and third differ at the .01 level or better.

Figure 6 shows that the three experimental groups did not differ very markedly in terms of the number of 'neurotic' responses made. Typically, this was a form of behavior which appeared early in the experiment in all groups but then gave way either to the 'normal' or to the 'delinquent' pattern. This change, like the others already noted, presumably represents a form of true learning



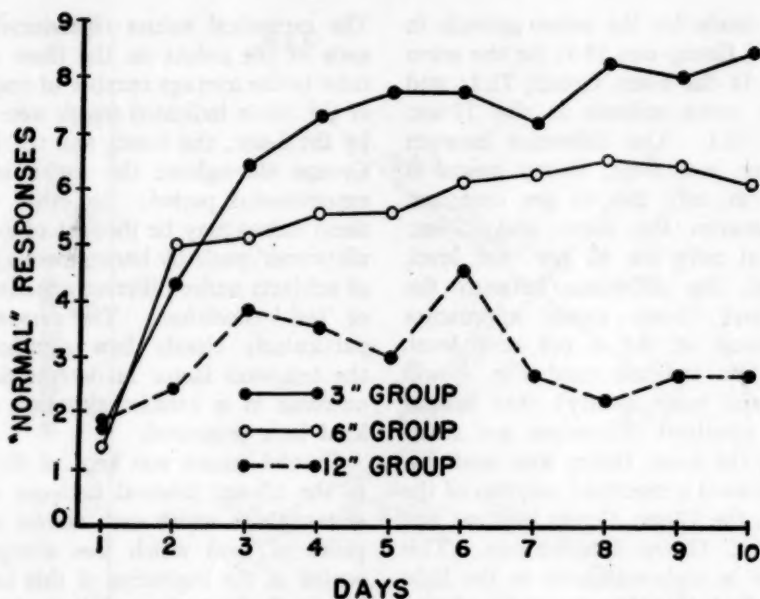


FIG. 4. Curves showing the average incidence of 'normal' responses made by the seven animals constituting each of the three experimental groups. These curves have already been presented, separately, in Figs. 1, 2, and 3; they are here brought together in order to make possible a more direct comparison.

rather than a shift in either of the primary motivational determinants, since both hunger and shock were held objectively constant throughout the experi-

ment (as inferred in the one case by body-weight and in the other by readings of the milliammeter).

The average number of 'neurotic' re-

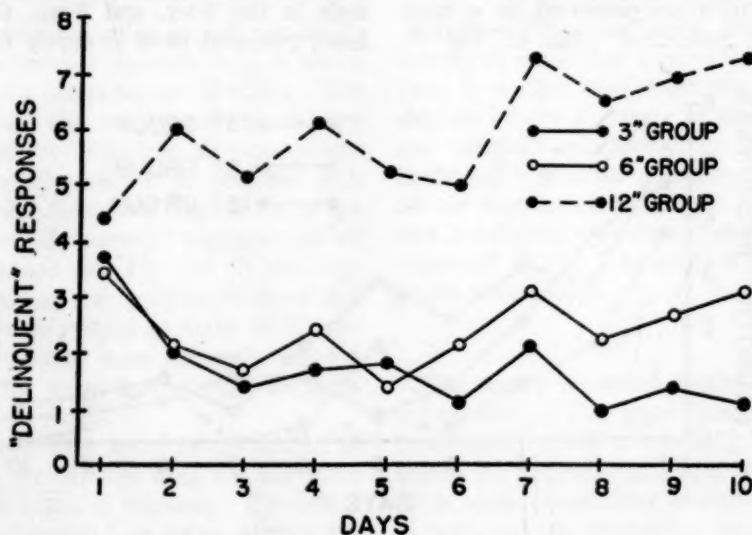


FIG. 5. Average incidence of 'delinquent' responses made by the seven animals constituting each of the three experimental groups.

sponses made by the seven animals in the 3-sec. Group was 15.4; for the seven animals in the 6-sec. Group, 21.1; and for the seven animals in the 12-sec. Group, 10.1. The difference between the 3-sec. and 6-sec. Group means is reliable at only the 45 per cent and that between the 6-sec. and 12-sec. means at only the 40 per cent level. However, the difference between the 6-sec. and 12-sec. means approaches significance, at the 8 per cent level. These data indicate (and Fig. 7 will show even more clearly) that insofar as the obtained differences are trustworthy, the 6-sec. Group was most disposed toward a 'neurotic' solution of the conflict, the 12-sec. Group least so, and the 3-sec. Group intermediate. This outcome is understandable in the light of the fact that the 'normal' solution was found relatively easily by the 3-sec. animals and the 'delinquent' solution was the one most readily adopted by those in the 12-sec. Group; being caught in the middle, so to speak, the 6-sec. animals were more disposed toward a 'neurotic' solution.

The trends and relationships shown in Figs. 1 to 6 are presented, in a more abstract, condensed form in Fig. 7.

The numerical values reproduced near each of the points on the three curves refer to the average number of responses of the kinds indicated which were made by the 3-sec., the 6-sec., and the 12-sec. Groups throughout the entire ten-day experimental period. In other words, these values may be thought of as overall 'scores' made by homogeneous groups of subjects under different experimental, or 'test,' conditions. The curves show particularly clearly how significant is the temporal factor in determining the outcome in a conflict situation of the kind here presented.

Careful record was kept of the point in the 60-sec. interval between successive trials at which each animal ate the pellet of food which was always presented at the beginning of this interval. Figure 8 shows these data in summary form. The relatively short average eating latency of the 12-sec. Group is explicable in terms of the great number of 'delinquent' responses made by this Group, *i.e.*, since the punishment for immediate eating was considerably delayed, it had relatively little inhibitory influence. On the other hand, the animals in the 3-sec. and 6-sec. Groups, being punished more promptly for eat-

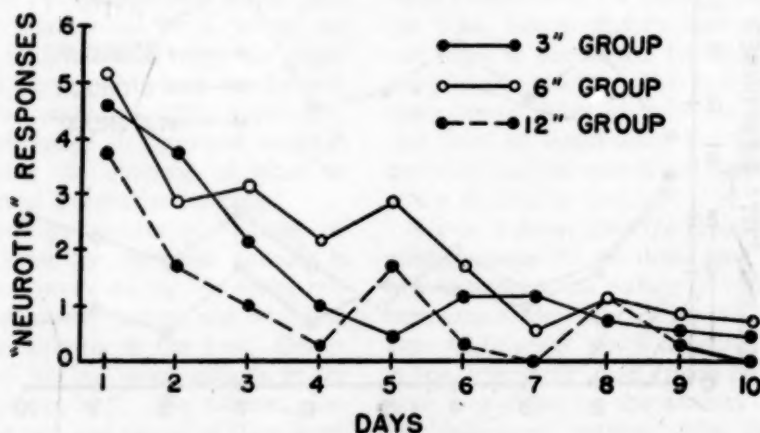


FIG. 6. Average incidence of 'neurotic' responses made by the seven animals constituting each of the three experimental groups.

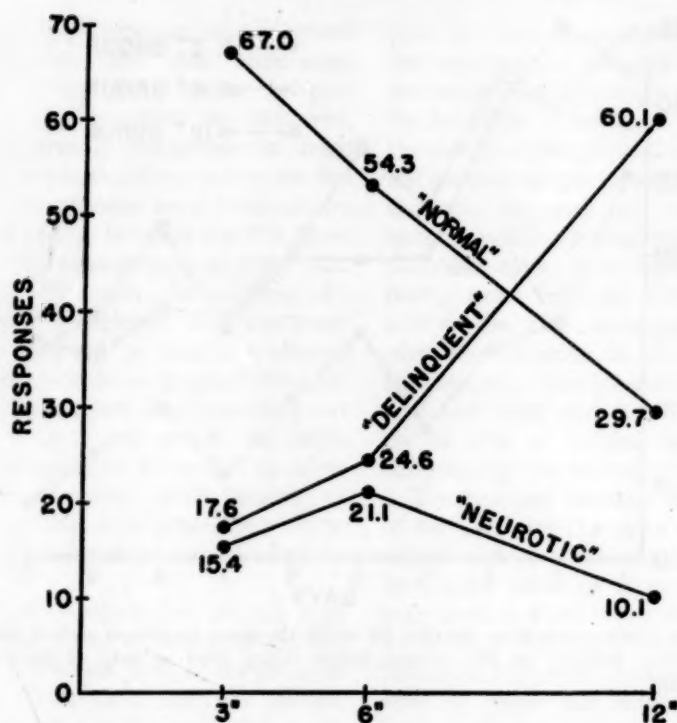


FIG. 7. The values indicated on the above curves represent the average number of each of the three different kinds of responses made by each of the three experimental groups. These nine values give in summary form the data shown in the nine 'learning' curves which are presented in various combinations in the preceding graphs.

ing within the tabu period, tended to favor a 'normal' solution, each of which involved a postponement of eating. The fact that the average eating latency starts relatively high in all three groups and gradually declines is consistent with the similar downward trend noted in the incidence of 'neurotic' responses in all three groups (see Fig. 5). It also suggests that as the experiment progressed the animals learned to make their 'normal' responses more promptly, instead of waiting unnecessarily after the tabu period had ended.

There is little point in attempting to present the latency data for the three different types of response. By definition, a 'neurotic' response always involved a latency of 60 seconds, and a

'delinquent' response never involved a latency of more than 3 seconds. Therefore, in neither case would the latency data be of any interest. In the case of the 'normal' responses there was undoubtedly a decrease in average latency as the experiment progressed, but this fact is sufficiently evident from the data presented in Fig. 8 to make a separate graph unnecessary.

#### IV

The results described in the preceding sections of this paper indicate that punishment which is belatedly administered for the occurrence of a forbidden act is much less effective in enabling rats to work out an integrative solution to the type of conflict situation employed

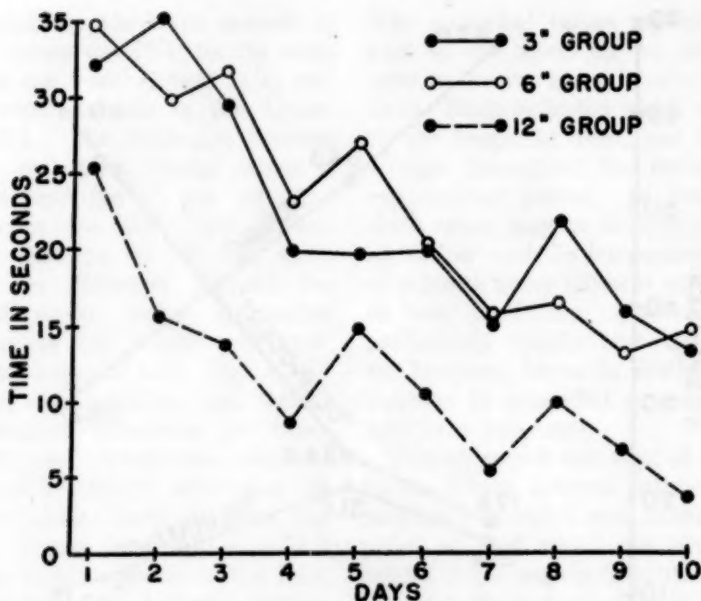


FIG. 8. The above curves show the time by which the seven animals in each of the three experimental groups delayed, on the average, before taking food on each of the ten days of experimentation.

in this investigation than is punishment which is more promptly administered. Or, to put the matter differently, our results show that the capacity of the rat to compare and 'balance' the good and bad consequences of an act is very dependent upon the temporal order and timing of these consequences. Thus, if the reward (hunger reduction) for engaging in a given act comes at once and the punishment (electric shock) shortly thereafter, the rat is able to resolve the conflict integratively ('normally'), but if the punishment is delayed, by more than a few seconds, the rat is likely to become confirmed in a non-integrative ('delinquent' or 'neurotic') pattern of behavior.<sup>16</sup>

<sup>16</sup> It should be noted that the experiment here reported deals with only one of the two dilemmas described in Section II, namely, that arising from having a small reward occur first and a larger punishment later. One could also investigate, with a slightly different experimental set-up, the effects of having a small

In fact, the capacity of the rat to engage in integrative problem-solving is even more circumscribed than would at first appear on the basis of the experimental findings so far reported. In the course of exploratory work, we found that if, during the second stage of the experimental procedure, we continued to turn the buzzer off at the moment the food was presented (as we did during the first stage of training), our rats could not learn to behave integratively, regardless of whether the punishment came relatively soon or late. Under this regime, rats sometimes made 'normal' responses, but they didn't show any improvement in the frequency with which they made them. Various researches (4, 9, 89) have suggested that under at least certain circumstances rats are capa-

punishment come first and a large reward later. Presumably the temporal factor would be no less important in producing non-integrative behavior in the second case than our results show it to be in the first.



ble of making fairly accurate temporal discriminations, but our exploratory findings indicate that, under the particular conditions which we employed, it was apparently impossible for them to learn to discriminate, purely on the basis of the stimulus trace produced by the buzzer (42), between the first three seconds (the tabu period) and the later portion of the trace (the safe period). In the main experiment as it was eventually carried out we therefore allowed the buzzer to continue to sound throughout the tabu period, thus providing our subjects with a cue which was sufficiently conspicuous to enable them to make the necessary discrimination, at least under the more favorable circumstances of relatively prompt punishment.<sup>17</sup>

It will be recalled that we not only allowed the buzzer to sound throughout the tabu period but also, in the event of violation of the tabu, until the electric shock had come and gone. This latter provision was introduced as a means of helping our subjects 'make the connection,' or 'bridge the gap,' between what happened in the tabu period and what happened later by way of punishment.<sup>18</sup> The impressive thing is that, even with these aids, the time factor was still so crucial in determining whether our sub-

jects hit upon the integrative solution to the experimental problem or adopted a non-integrative adjustment. Unaided, the rat seems to be almost completely at the mercy of the gradient of reward and the gradient of punishment. If a given response has two (or more) consequences which are separated by any appreciable time, this organism is evidently quite helpless, without external aids of the kind we supplied, to cope with the situation in anything but a stereotyped, non-integrative manner. And even with such aids, the time factor is still of critical importance in determining the outcome.

The contrast between the 'stupidity' of our rats and the quite extraordinary talents of normal adult human beings for integrative behavior is so great that it may seem a sheer waste of time to attempt to study this phenomenon in so simple an organism. However, one must keep in mind that an altogether too large number of adults in our society are not 'normal,' *i.e.*, have not achieved an optimal integration.<sup>19</sup> Perhaps a searching analysis of the reasons for integration failure in the rat will throw some light upon the cause of integration failure at the human level.

So long as the unique human capacity for integrative behavior was regarded as a divine gift, just so long was integration failure regarded as a demoniacal curse, beyond which no further explanation or understanding could be sought. Attempts to deal with this problem

<sup>17</sup> Several months after our experimentation was completed, Miss Babette Samelson raised the question as to whether animals which had learned, with the aid of the buzzer, to solve the dilemma with which we confronted them could have continued to behave integratively thereafter, without the help of this external cue. As yet we have not had an opportunity to check on this interesting point.

<sup>18</sup> This arrangement was based upon the fact, demonstrated by Pavlov (73) and others, that 'delayed' conditioned responses are more readily established than 'trace' conditioned responses. For an instructive demonstration of the role of 'tokens' in helping span relatively long periods of time between the performance of a response, or 'work,' and reward, see Wolfe's experimentation with chimpanzees (87).

<sup>19</sup> As this statement implies, we do not accept the 'cultural' definition of 'normality,' *i.e.*, we do not identify normality with social conformity. If a culture is itself badly integrated (59, 62), a high degree of conformity will, in fact, automatically insure a low degree of personal normality in our sense. In such a culture the individual's only hope of achieving integration must lie in some degree of culture-repudiation and non-conformity. This is not to deny, however, that the ideal situation is one in which social conformity and personal integration maximally coincide.

along naturalistic lines have almost universally stressed the role of something called 'reason,' but usually without giving any very satisfactory definition of this faculty. In the midst of many empty and contradictory assumptions, there is nevertheless one that has seldom been disputed, namely, that reason is intimately associated with articulate (predicative) language.

Many lower animals can respond to and even make *signs* (signals and cues), by means of which 'communication' is said to occur; but in order for an organism to 'reason,' it must be able to do something more: It must be able to use signs as *symbols*, i.e., it must be able to make signs and then respond to them.<sup>20</sup> The capacity to engage in this latter process, which one might call 'self-communication,' seems to be the essence of what we mean by 'having reason.'

Let us look more closely at this process. In the chapter on 'Language and Symbolism' in Yerkes' book, *Chimpanzees* (90), reference is made to an experiment in which a chimpanzee was tethered in the middle of a large room and allowed to watch the experimenter deposit food in one of four boxes which were located in the four corners of the room. The chimpanzee was then led back to its living quarters. A few minutes later the animal was returned to the experimental room and allowed to select one of the four boxes. If the box containing the food was left in its original position, the ape could respond appropriately, even after relatively long delays. But if, in the ape's absence from the room, the box containing the food was replaced by one of the other

boxes of a different color and put where this other box had originally been, the animal persisted in looking for the food on the basis of room-position rather than box-color. Since the chimpanzee is known to have excellent color vision, his failure to solve such a problem seems most remarkable. Yerkes says:

This behavior differs so strikingly from our own that it seems amazing. . . . To us it seems almost incredible that with both boxes before it, but interchanged in position, the animal should go where the food had been concealed, in spite of the altered appearance of the box, and there search persistently for its expected reward. Under like circumstances a person would notice at once the changed appearance of the food box and look about for the original box. . . . We were finally forced to admit that our subjects [failed in this experiment] because they lacked a symbol or representative process comparable with our word 'green' (90, pp. 178-179).

Yerkes' experiment shows that the chimpanzee is capable of carrying away with it from a situation of the kind just described some inner change or state which 'stands for' the response which it will later make when it reencounters the same situation.<sup>21</sup> But as Yerkes points out, this symbolic capacity is evidently limited to the *spatial* aspects of the situation. We should not be surprised, therefore, at the rat's inability to behave integratively in a situation in which the problem lies in the *temporal* dimension.

But neither should we conclude that

<sup>21</sup> It will be remembered that, in his original work on 'delayed response,' Hunter (44) concluded that the capacity to respond to cues long after they have disappeared involved the maintenance of fixed bodily postures, or sets. The experiment by Yerkes as well as other research indicates that this is probably not the case, although we still do not know precisely how this feat is accomplished. When this problem is solved, we should have a better understanding of so-called one-trial learning and certain forms of 'insight.'

<sup>20</sup> A response which thus serves as a basis for producing or guiding further behavior has been aptly referred to by Hull as a 'pure stimulus act' (41). And Miller and Dollard (63) have spoken of emotions as 'response-produced drives.' The relationship of symbols and emotions will be considered in greater detail below.

the rat is totally without skill in the use of symbols. A number of experimenters have noted that, at the choice point in mazes, rats are likely to engage in what Tolman (83) has called 'vicarious trial-and-error behavior,' *i.e.*, the rat will turn tentatively in one direction, then in the other, and so back and forth until it finally 'decides' to take one of the paths rather than the other. Muenzinger and Gentry (71) have commented on the occurrence of a similar type of behavior in rats when confronted by an auditory discrimination problem, but in the maze it can hardly be such a problem that the animal is trying to solve since this behavior also occurs when auditory (and even visual) cues are minimal or lacking altogether. Closer analysis suggests that these little motions are a form of symbolic exploration, or 'reasoning.' In turning the head to the right or to the left, it is as if the animal were trying to anticipate, or 'feel,' the consequences of actually going in that direction. A type of comparison, or 'discrimination,' may indeed be taking place, but it is a comparison of *emotions*, not visual cues. 'Deciding' or 'willing' to go one way rather than the other would thus seem to be determined on the basis of which 'pure stimulus act' aroused the strongest anticipation of reward and the least anticipation of punishment.<sup>22</sup>

<sup>22</sup> It would appear that the failure of our rats to solve the experimental conflict with which we confronted them is due, not to a complete absence of symbolic capacity, but rather to the fact that they had no pure stimulus act by means of which to re-present the impending electric shock. It is interesting to ask what the limits of integrative ability might be in both the rat and the ape if they were put through a course of training in the use of symbols comparable to that which human beings receive. As Lewin has pertinently remarked: "An education for the present seems here to be in no sense necessary. The pedagogical task seems, rather, to be precisely the opposite extension of the narrow horizon of the present in spatial (including social) and temporal dimensions. For today Goethe's say-

This is not the place to elaborate such an hypothesis, but it is interesting to compare Freud's theory of human thought. He says:

Thinking is an experimental dealing with small quantities of energy, just as a general moves miniature figures about over a map before setting his troops in motion. In this way, the ego anticipates the satisfaction of the questionable impulse, and enables it to reproduce the painful feelings which are attached to the beginning of the dreaded danger-situation. Thereupon the automatic mechanism of the pleasure-pain principle is brought into play and carries through the repression of the dangerous impulse (28, p. 124).

Perhaps the commonest cause of our failure to fathom the nature of human 'reason' has been the tendency to contrast it with 'feeling.' If the foregoing analysis be sound, we must come to see 'emotion,' not as the antithesis of 'intellect,' but as an indispensable ingredient and adjunct thereto. In its primitive and most basic form, reasoning seems to consist of a succession of pure stimulus (symbolic) acts whereby the remote as well as immediate consequences of an impending overt action are brought into the psychological present, in full force so to say, and balanced and compared in a manner that is quite out of the question in an organism which has to rely solely upon the gradient of reward and the gradient of punishment. In this way human beings have been able to develop the capacity of 'moral judgment,' 'planfulness,' or 'rationality,' in a way that sets them well apart from all other animals. Or in other words, skill in the use of symbols is at the basis of certain forms of 'memory,' 'attention,' 'interest,' 'imagination,' and other forms

ing is still valid—"Who cannot give an account of three thousand years remains in the darkness of inexperience, can live only from one day to another" (56, pp. 172-173). See also Lewin (57).

of higher mental processes which are uniquely human. Let us see, now, if this assumption is of any assistance in understanding what it means to 'lose one's reason,' *i.e.*, to suffer an impairment of the integrative functions, at the human level.

But first let us ask what circumstances may prevent an organism from developing 'reason.' These may be listed as follows: (1) We must immediately acknowledge the fact that infra-human organisms are congenitally limited in the matter of brain complexity and capacity; only man has a sufficiently elaborate nervous system to allow the development of at least the highest forms of symbolic functioning. (2) Human beings differ among themselves in this connection; and in the extremes of feeble-mindedness, the capacity for symbolic functioning may be well below that of the so-called lower animals. (3) Nor do we find 'reason' even in perfectly normal human beings at birth; it is a capacity whose development is dependent at once upon continuing neural maturation and a complicated process of tuition. (4) That 'reason' is a product of such tuition is indicated in an especially decisive manner by the fact that if certain sensory avenues are blocked (notably vision and hearing), the individual remains, unless given very special training, little better than a 'dumb animal.' (5) We do not know precisely what sort of individual a human being would become if he grew up in complete social isolation on the proverbial desert isle; but our knowledge of feral children suggests that without contact with human culture, the human animal does not even remotely approximate the average level of socialized mentality.

Loss of 'reason,' or reasoning ability, may most obviously result from brain damage. Of special significance in this connection is the work of Goldstein on

the psychological effects of head injuries sustained by German soldiers during the first World War. This writer reports that the most characteristic consequences of cortical lesion is an impairment of 'abstraction,' *i.e.*, the ability to 'transcend concrete (immediate) experience.' Goldstein remarks that whenever an individual with such a deficit has to "refer to things in an imaginary way—then he fails. . . . Or we might point to the patient's inability to emancipate and withhold himself from the world, the shrinkage of his freedom, and his greater bondage to the demands of environment. The most general formula to which the change can be reduced is probably: The patient has lost the capacity to deal with *that which is not real—with the possible*. . . . Depending on which of these manifestations of the basic disturbance has been brought into focus, they have been named respectively: disturbance of '*symbolic expression*' (Head), of the '*representational function*' (Woerkom), of '*categorical behavior*' (Gelb and Goldstein)" (32, pp. 29-30).<sup>23</sup>

In a suggestive paper entitled, 'Emotion as relative functional decortication: the role of conflict,' Darrow (10) has called attention to the familiar 'disorganizing' effects of 'excited emotion' and has shown that heightened blood pressure is the most characteristic physiological accompaniment. The cause of such emotion he finds in 'dynamic conflicts' which threaten the individual's "accepted patterns of thinking and acting and their corresponding patterns of cortical activity. Most often the accepted and established patterns which are threatened in excited emotion are those which have habitually represented and furthered the physical safety and comfort, the intellectual and social dig-

<sup>23</sup> The results of 'psychosurgery,' as recently reported by Freeman and Watts (17), present an essentially similar picture.



nity and integrity of the individual. . . . The hypothesis we set forth is that active conflict in the normal individual is frequently the essential condition for the release of the primitive autonomic subcortical mechanisms of *excited* emotions" (10, p. 572).<sup>24</sup>

Here we see an example of a *temporary* impairment of the 'ego,' or integrative, functions which provide an intermediate link between those instances of integration failure due to structural defects already reviewed and the type of integration failure found in the purely functional process of repression. It is perhaps stretching Darrow's argument to say that the mental blocking that often occurs in strong emotion is designed to *protect* the very functions which are temporarily obliterated thereby, but in repression the process seems to be precisely of this nature. Freud has repeatedly remarked that repression of an impulse or memory characteristically occurs when it arouses effects which are so strong that they threaten to overwhelm the 'ego.' To this extent repression is definitely a 'defensive' mechanism, but the resulting advantages usually prove to be achieved at a great cost. Repression is effected by excluding the symbolic representative of certain impulses from consciousness, *i.e.*, from the dominant integrative center of the personality. Although repression thus brings a momentary peace, the process is likely to be pathognomic for the reason that energies which formerly submitted themselves to the management of, and thereby strengthened, the 'ego' are now withdrawn and left free to seek—through those habits called 'symptoms'—their own irresponsible, non-integrative paths to gratification. This is why Freud has characterized re-

pression as a reversion from the 'reality principle' to the more primitive 'pleasure principle,' from the 'ego' (consciousness) to the 'id' (the unconscious).

By way of summary of this section, it may be said that living organisms which are unable (for any of several possible reasons) to employ symbols versatilely are doomed to relative fixity of response, which, in the case of responses which have both remote and immediate consequences, is almost certain to result in a failure of 'integration.' Such a failure of integration was noted in the animal experiment here reported, and results which have been reported by others show how limited the capacities of infra-human organisms in general are in this respect.<sup>25</sup> Goldstein remarks that the "performances which the patient [with cortical injury] can carry out, and to which he always tends to cling, have the character of stereotype and exhibit little variation" (32, p. 42). Korzybski (51) maintains that a loss of 'conditionality' of response is the essence of abnormality in human beings. Murray (72) has similarly commented on the loss of flexibility as a key problem in abnormality. And Kubie has said that "the nuclear problem in the neurosis is the repetitiveness of its phenomenon" (54, p. 23). "The flexible repetitiveness which is an inescapable part of the life of the normally developing child becomes its rigid and inflexible neurosis" (54, p. 28).

The common denominator in all these forms of non-integrative behavior seems to be the inability to use symbols appropriately as a means of bringing remote as well as immediate consequences into the present in such a manner that they may exert an influence proportional to their objective importance.

<sup>24</sup> Cf. Lewin's description of the experiment by Dembo on the 'experimental simplification of the structure of the person' (55, pp. 265-267).

<sup>25</sup> For a more extended review see Everall (14). Cf. also Robinson (76), and Morgan and Lannert (65) on the problem of 'perseveration' at the human level.

## V

Although it is evident that the temporal factor has not been sufficiently emphasized in the analysis of non-integrative behavior, neither has it been entirely overlooked.<sup>26</sup> In one of the papers already cited, Kubie makes the following allusion to the time element:

... the rigid ultimate forms of these repetitive patterns seen in neuroses have been reached only after a long process of trial and error, during which many and varied patterns of neurotic effort have appeared and been abandoned. The neurotic pattern which finally persists, and which becomes most repetitive and which has so often been characterized as manifestations of a 'repetition compulsion,' proves invariably to have been the one that served the largest amount of neurotic demands, or which gave the patient the greatest *temporary relief from tension* (53, pp. 399-400). (Italics the authors'.)

In a later paper this author similarly remarks:

With the acquisition of the power of abstract thought and fantasy, the repetitive tendencies of both normal and of pathological phenomena are increased immeasurably. . . . Like all substitutive symptom formations, fantasy adds fuel to the fires it is supposed to quench, and kindles expectations which it cannot gratify. . . . Only during the actual moment of fantasy is there a *passing illusion of relief*, followed at once by a sharpened sense of deprivation and an increased yearning (54, pp. 33-34).<sup>27</sup>

<sup>26</sup> Israeli (45, 46), Frank (16), Lewin (55), Murray (72) and others have discussed some of the implications of time for general personality theory. However, it has not been as explicitly related to the problem of conflict as would seem indicated. The most systematic discussion of conflict which has appeared to date is that of Miller (64), in which the temporal dimension is omitted almost completely.

<sup>27</sup> Italics added. The quotations invite attention to a tremendously important but difficult problem. If symbols are essential to the kind of integrative problem-solving which we call 'reason,' they are probably also the vehicle

Freud's most explicit references to time as a factor in integration occur in the context of his discussions of the reality- as opposed to the pleasure-principle and of the 'ego' as opposed to the 'less well organized' parts of the personality. The following excerpts, drawn from various of Freud's writings, summarize his views in this connection.

The processes of the system Ucs (unconscious) are timeless; *i.e.*, they are not ordered temporally, are not altered by the passage of time, in fact bear no relation to time at all. The time-relation . . . is bound up with the work of the system Cs.

The processes of the Ucs are just as little related to reality. They are subject to the pleasure-principle; their fate depends only upon the degree of their strength and upon their conformity to regulation by pleasure and pain (29, p. 119).

The transition from the pleasure-principle to the reality-principle is one of the most important advances in the development of the ego (30, p. 312).

We know that the pleasure-principle is adjusted to a primary mode of operation on the part of the psychic apparatus, and that for the preservation of the organism amid the difficulties of the external world it is *ab initio* useless and indeed extremely dangerous. . . . It is replaced by the 'reality-principle,' which without giving up the

of hallucination and delusion. It is obviously useful to be able to anticipate remote rewards and punishments and to compare these with the more immediate consequences of behavior; but when the imaginative functions become hypertrophied, so to speak, we approach the realm of psychosis. In this paper we have thus far conceived of symbols wholly as a means whereby the individual's relation to reality is improved; but if the individual learns to use symbols as ends in themselves, *i.e.*, as a way of obtaining emotional satisfactions which are independent of reality, they lead to an escape from rather than a mastery of the external world. The psychology of psychosis is still but poorly delineated, but it becomes increasingly clear that better understanding in this area will presuppose a more penetrating analysis of symbolism and semantics.

intention of ultimately attaining pleasure yet demands and enforces the postponement of satisfaction, the renunciation of manifold possibilities of it, and the temporary endurance of 'pain' on the long and circuitous road to pleasure (23, p. 5).

It would seem but a short step from these formulations to the theory of persistent non-integrative behavior which we have sketched; but, as indicated in Section I, Freud instead fell back upon the dubious doctrine of the 'repetition compulsion.' This retrogressive move on the part of the leader of psychoanalysis has meant that progress along these lines has had to come from analysts who, to some extent, have deserted Freud's leadership. Thus, we find that the concept of 'vicious circle,' while wholly compatible with and a logical extension of earlier Freudian theory, has actually been evolved, as an alternative of the 'repetition compulsion,' by analysts of a slightly renegade complexion. Horney says:

F. Kuenkel in *Einfuehrung in die Charakterkunde* has drawn attention to the fact that the neurotic attitude calls forth a reaction of the environment, by which the attitude itself is reinforced, with the result that the person is more and more caught, and has greater and greater difficulty in escaping. Kuenkel calls this phenomenon Teufelskreis (39, p. 68, footnote 1).

The formation of a vicious circle is typical not only in the context in which it has been discussed here; generally speaking it is one of the most important processes in neuroses. . . . The formation of vicious circles is the main reason why severe neuroses are bound to become worse, even though there is no change in external conditions. Uncovering the vicious circles, with all their implications, is one of the important tasks of psychoanalysis (39, p. 138).

And Maslow and Mittelman have similarly remarked:

This sequence, which is a 'vicious circle,' is one of the most important factors in the

persistence and recurrence of abnormal psychological manifestations. The concept implies that the patient takes certain measures to enable himself to function or to escape catastrophe, but that these measures renew his difficulties if he fails, and even, to some extent, if he succeeds (61, pp. 183-184).

The child who resorts to enuresis as a means of venting resentment toward indifferent or harsh parents and thereby elicits still more rejection and loss of love; the business man who, when faced by the prospect of failure, becomes alcoholic and thus incapacitates himself for taking what might have been effective recuperative measures; or the woman who jealously nags her husband and in so doing destroys such residual affection as he may have for her—these are everyday examples of the self-defeating, shortsighted, non-integrative strategy which constitutes the 'vicious circle' and which seems to be a common feature of all the psychoneuroses.

It is true that in the laboratory study of non-integrative behavior which has been reported in this paper, we do not have a perfect analogue of a 'vicious circle.' That is to say, in trying to reduce their hunger by eating the food as soon as it appeared, our 'delinquent' rats did not cause their hunger to be accentuated later; instead, they encountered a different form of drive-increase, namely, electric shock. Likewise, in trying to reduce their anxiety by not eating the food at all, our 'neurotic' rats did not cause their anxiety to be subsequently increased; instead, they simply experienced a growing hunger. However, it is clear that in our experiment, as in a situation involving a 'vicious circle,' the critical consideration is the time element. The fact that a given action often has not only immediate but also remote consequences and that, without the skillful use of symbols, the former tend to outweigh the latter is the basic

condition of persistently non-integrative behavior in both cases.

It would be a relatively simple matter to design an experiment which would provide at least a rough paradigm of the 'vicious circle.' Let us suppose, for example, that rats were first taught to press a bar as a means of turning off an electric shock administered through the grill on which they stood. Suppose that after this bar-pressing response had become prompt and specific, the experimenter decided to try to break this habit by means of punishment consisting of a re-application of the shock a few seconds after this particular shock-eliminating response had occurred. The animal would, of course, react to the punishment by making precisely that response for which the punishment was applied.<sup>28</sup> This response would terminate the shock but would insure its re-appearance a little later. Since the relief obtained by pressing the bar would be immediate and the punishment remote, such behavior might be perpetuated indefinitely. The only way for the rat to escape from such a 'vicious circle' would be to stop making the bar-pressing response and begin searching for a new way of eliminating the shock without at the same time precipitating its recurrence. The difficulty obviously is that, with the automatic effects of reinforcement operating so powerfully to perpetuate this non-integrative act, it is a question whether there is any stronger mechanism that could come to the rat's

rescue and save it from this continued self-torture.<sup>29</sup>

This discussion throws into relief the need for what seems to us to be a very important terminological distinction. Psychological writers commonly use *integration* and *adjustment* as if they were strictly equivalent concepts. This, we believe, is a major cause of theoretical confusion. For example, Shaffer (77), following Hamilton (33), has given wide currency to the expression 'persistent non-adjustive behavior' as a synonym for neurosis. "The core phenomenon of the generalized psychoneurosis," he says, "is a persistent non-adjustive emotional reaction to baffling personal difficulties" (77, p. 253). Although this usage drives Shaffer into the awkward necessity of acknowledging the 'adjustive value of nonadjustment' (77, p. 257), he neglects the way out of the difficulty which seems to us most clearly indicated. The distinguishing characteristic of both neurosis and criminality is not that they are *nonadjustive*; if modern experimental and clinical inquiry shows anything it is that all persistent behavior is in some sense adjustive (drive-reducing). What should be stressed instead is their *non-integrative* character; and this, as we have tried to show, is mainly a function of a failure properly to compare and balance consequences which are unevenly distributed along the time dimension. If we could but abandon the practice of using the term adjustive (nonadjustive) where we should say in-

<sup>28</sup> Not realizing that thumb-sucking and other forms of so-called infantile eroticism are frequently a response to anxiety (13), parents frequently treat such behavior in a way which still further undermines the child's security and thereby aggravates the very tendency which the parent is intent upon eliminating. Punishment and rejection displayed in this context may lead to chronic disharmony and destructiveness in the child-parent relationship. Much school 'discipline' probably also follows this pattern.

<sup>29</sup> Is this the basic pattern of 'masochism'? Insofar as all neuroses are said to represent a 'masochistic trend,' the answer is probably Yes; but the behavior which this term is used to designate more specifically seems to follow a different pattern, namely, one in which there is severe 'guilt' which can be dissipated only by soliciting—directly in sexual masochism, indirectly in moral masochism—some form of punishment which will afford at least temporary relief. Cf. Freud's discussion of 'criminality from a sense of guilt' (21); also Fenichel (15, pp. 463-464).



tegrative (non-integrative) and vice versa, it should aid materially in sharpening our theoretical perceptions.

## VI

We anticipate that the foregoing analysis of integration and integration-failure will not carry much conviction for some readers. They will point out that we have based this analysis upon the Law of Effect and will advance a common, and to them, a fatal objection thereto. The Law of Effect holds that behavior is determined by its consequences, that if these consequences are rewarding the behavior is reinforced whereas if the consequences are punishing the behavior tends to be inhibited. Yet it is an undebatable fact that behavior often develops without any ostensible reward and may even survive for an astonishingly long time in the face of what seems to be nothing but pain and adversity. In fact, the capacity to display a certain amount of 'autonomy' in this respect is a mark of character and good 'morale' in this culture, just as too great dependence upon comfort and pleasure is looked upon as a sign of personal weakness. How, if at all, can these facts be reconciled with the theory?

One important source of confusion arises from a tendency to equate 'reward' and 'award.' No supporter of the Law of Effect has ever held that actions can be reinforced only by situations in which the actor receives something—food, money, praise, or whatever—from the outer world. Everyone knows that human beings (and probably even lower animals to some extent) are normally capable of and do in fact very often engage in self-rewarding processes. Thorndike (82) has explicitly acknowledged as the 'confirming,' or 'Okay,' reaction what passes more commonly as "know-

ing when one is right." The supposition is, therefore, that habits which sometimes seem to develop and persist without benefit of reward are simply habits in which the reward is subtly self-administered, either with or without the subject's conscious knowledge.

The fact that certain habits, or 'traits of character,' may persist in the face of consistent punishment raises a more difficult problem. One possibility is that the punishment, which is observed, is offset by self-administered reward, which is not observed. The approval of one's own conscience may, for example, be quite as powerful in a positive sense as its disapproval (in guilt, depression, etc.) may be in the negative sense. But there may be more to the problem than this. Personal integration is a precious thing, and once a satisfying, harmonious personality pattern has been achieved, the 'strength of the total ego' seems capable, in ways which have not yet been clearly analyzed, of being mobilized in support of any single part (habit) for which the going is particularly hard. In this sense we may grant to well developed human personalities a certain type of 'autonomy'; but this is not to say that punishments, if they are real in the sense of causing genuine inner pain and tension increase, do not automatically put a strain upon 'the person.' Shakespeare remarked long ago that "every man hath his price" in the moral sense, and the experiences of the current war (in concentration camps as well as combat) seem to be showing that every man likewise has his breaking point, psychologically. The results of Dollard's (11) recent survey show unmistakably that hunger, thirst, fatigue, fear, and other discomforts tend automatically and inevitably to drive men out of battle. Integration, ideology, morale, or whatever one wishes to call it can withstand varying amounts of such punish-

ment without 'cracking,' but there is no absolute immunity.<sup>30</sup>

Whiting and Mowrer (86) and Mowrer and Kluckhohn (70) have recently described an experimental paradigm of personality development which emphasizes the view that socialization is always an uphill business and that there is continuous danger of regression to lower, easier forms of adjustment which have existed earlier. This analysis obviously draws heavily upon the works of Freud, particularly the thesis put forward in his *Civilization and Its Discontents* (26). But it now appears that something has been lacking, or at least insufficiently stressed, in this type of analysis. To say that growing up and being trained for adult responsibilities in any society is one great, joyous adventure is surely more sentimental than sensible. But is it not possible that the perpetuity of human resistance to and resentment of culture has been somewhat exaggerated by psychoanalytic writers? That life in a human society, even a relatively bad one, is better than social isolation is attested by the whole course of history. And it now seems probable that although induction into such a life is begun without the small child's consent and carried on for a considerable time against it, a point is eventually reached, in 'normal' cases, at which something very momentous happens: the individual becomes aware of "what it is all about" and begins to line up, willingly, on the side of morality and social order.

The delinquent or criminal obviously fails to make this transition, or makes it very imperfectly; whereas the neurotic makes it only at the expense of partial psychic self-destruction (repression). For the more fortunate type of indi-

vidual, this 'conversion'<sup>31</sup> gives him the strength and stability to labor, deny himself, and to have a concern for others which marks the difference between the pleasure-principle and the reality-principle, between a well socialized man and a beast. This, in short, is the highest that has been attained in terms of personal integration and the Good Life; but if we deny that it is based upon the same elemental principles that govern 'lower' forms of behavior, whether human or infra-human, we cut ourselves off from the broader type of understanding for which science ever strives.

We anticipate one other source of objection. There can clearly be no adequate human psychology which does not give a satisfactory account of neurosis and criminality. This, as we have seen, demands that we be willing to tackle the problem of integration which, in turn, leads straight to questions of social ethics and value. In the Middle Ages all behavior disturbances were frankly interpreted in religious terms.<sup>32</sup> Then there followed an interlude in which biological and even chemical explanations were in vogue. We are now swinging back toward the 'spiritual' type of explanation, but with an obstacle imposed upon us by an historical coincidence. In attempting to become a science, academic psychology set a serious delimitation upon itself. Traditionally, interest in and the quest for personal unity have been regarded as the proper concern of religion and ethical philosophy, of which the new science was to have none. It was perhaps unavoidable that psychology should go through such an adoles-

<sup>31</sup> Adolescence is the period recognized in most societies as the beginning of the 'age of accountability.' It is also the time of most frequent religious conversion in our society and of initiation rites among primitive people. Cf. Freud on the normal dissolution of the 'Oedipus complex' (25).

<sup>32</sup> See, for example, Freud (24, pp. 436-472).

<sup>30</sup> No one has apparently noted that it is in the psychotic that 'autonomy,' in the sense of imperviousness to reality demands, is most nearly approximated. Cf. Freud's concept of narcissism (30); also footnote 27.

cent revolt on its way to maturity and self-sufficiency. But has not the time come when we can drop our defensiveness and self-imposed delimitations and turn energetically to this important area of human concern? If we can, the following decades should mark an unparalleled advance in social applications and systematic unification of our science.

## VII. SUMMARY

Persistent non-integrative behavior, *i.e.*, behavior which has consequences which are usually more punishing than rewarding, remains one of the important unsolved problems of psychology. The Law of Exercise ('repetition compulsion') accommodates the fact that behavior sometimes persists despite predominately painful consequences, but it provides no basis for explaining why such behavior, more commonly than not, gets eliminated. The Law of Effect ('pleasure-principle'), as traditionally formulated, accounts well enough for the elimination of non-integrative behavior, but it breaks down in those instances in which such behavior persists.

There are three alternatives:

1. We can continue to resort, now to the Law of Exercise, now to the Law of Effect, depending upon which seems most expedient at the moment; but this *ad hoc* procedure will never lead to a science with high predictive power.

2. We can abandon the attempt to deal with behavioral phenomena along conventional scientific lines and resort to a 'holistic' approach; but the danger here is that we will merely revert to prescientific voluntarism.

3. Or we can repudiate the Law of Exercise (a step well justified on empirical grounds) and see if the Law of Effect can be so refined and elaborated as to resolve the paradox of persistent non-integrative behavior.

An experimental paradigm with rats as subjects shows that the tendency for

a given action to be perpetuated or inhibited is influenced not only by the nature of the consequences ('effects') of that action but also by the *temporal order*, or *timing*, of these consequences. Thus, if an immediate consequence is slightly rewarding, it may outweigh a greater but more remote punishing consequence. And equally, if an immediate consequence is slightly punishing, it may outweigh a greater but more remote rewarding consequence. Living organisms which are not skilled in the use of *symbols* are severely limited in their capacity to resolve behavioral dilemmas of this kind and may, as a result, continue indefinitely to manifest so-called non-integrative behavior. But by introducing the time element (and the notion of reinforcement 'gradients'), it is possible for us to escape from the dilemma which such behavior presents from a theoretical standpoint.

The prodigious capacity found in normal adult human beings for using symbols, *i.e.*, for 'reasoning,' seems to have what is perhaps its greatest utility in enabling the individual to bring the remote as well as immediate consequences of a contemplated action into the *psychological present* and thereby compare and balance the probable (anticipated) rewards and punishments in a manner which enormously increases the chances that the resulting behavior will be integrative. Such behavior is properly termed *rational*, in contradistinction to the *pre-rational* behavior seen in lower animals.

Neurotic and criminal behavior may be said to represent either a fixation at or a regression to the pre-rational level of functioning. In psychosis, conflict is resolved in the opposite direction, by an over-elaboration of the rational (symbolic) processes: hence, the term *irrational*. As Angyal has remarked, "The conscious self, by over-stepping the realm of its legitimate influence, may

become a destructive factor. The relative autonomy of the symbolic realm within the total organism is the most vulnerable point of the human personality organization" (5, p. 123).

Until comparatively recently the dominant note in European and American psychology was rationalism. However, animal experimentation on the one hand and clinical observations on the other have equally revealed its inadequacies. The present paper attempts to locate rationality in a larger conceptual setting, midway on a continuum between the pre-rational and the irrational adjudicative processes.<sup>33</sup>

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<sup>33</sup> Compare Professor Edna Heidbreder's paper (34). Contrast Lewin's distinction between 'learning through motivation' and 'learning through cognition' (58).



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# THE PSYCHOLOGICAL SELF, THE EGO, AND PERSONALITY

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In a recent article in this Journal, Professor Gordon W. Allport,<sup>1</sup> called attention to the pervasive, unifying, and motivating function which the ego plays in the organization of human activity. He called attention also to the growing status accorded to the ego by contemporary psychologists. Readers of that exploratory paper will recall his recognition of, and concern with, the confusion among contemporary conceptions of the ego. In this paper we shall attempt to reduce the confusion and at the same time solve problems implicit in the discussion of the ego. Let us re-state the problem.

## I. THE EGO-PROBLEM AND THE FUNCTION OF THE SELF

As the concept was presented by Allport, there seemed to be a perpetual squinting on the part of the ego. By our author it is used at one moment in the *substantive* sense as a subject producing changes in behavior. For example: "The patient's ego takes command." "It senses the threats, . . . meets the world head-on" (3, p. 473). ". . . one other property of the ego . . . [is] its customary preoccupation with the future" (50, p. 474). But while the ego in these instances is itself the agent producing effects, it is also the object (and objective) of an implied subject. The ego has its own possessions and is

itself *possessed*. This sense may be called the *objective* sense. It is now the object of knowledge, of striving, on the part of a knower, striver, feeler, and purposer. It is the development by something and 'in' something.

The ego, then, functions in both substantive and objective senses. The article leaves no doubt that the ego itself is a development (3, p. 473), that it is not always involved in behavior, that it changes. When it is involved, it is an integrating and purposive magnet, but it is itself not a continuous function. The question, therefore, arises inevitably: What develops it, involves it, participates in it, and explains whatever continuity it does have? This question, 'What or who involves the ego?', may remind one of the futile infinite regress, but before declaring this verdict let us see if an answer can be given which accounts for what we do know about the ego and personality.

What seems to be called for is a psychological agent whose activities endure throughout changes in egos, personalities, and, for that matter, all other experiences which are identified as 'my' or 'his' experiences. My ego and personality may change, but it is clear to me that they are *my* readjustments, and that *I* am never completely exhausted or absorbed in any one adjustment. What, then, is the referent for the *I* or *he*, *my* or *his* to whom egos, personalities, or experiences are attributed?

The hypothesis here suggested is that *I* refers to a complex, unitary activity of sensing, remembering, imagining, perceiving, wanting, feeling, and thinking. These activities are the dynamic unity

<sup>1</sup> With the deepest pleasure I gratefully acknowledge the encouragement, acute criticism, and numerous suggestions made by Professor Gordon W. Allport in the development of this theme for which I alone must take the responsibility. The writings of Professor Edgar S. Brightman have exerted the strongest influence on the central concept here entertained.

referred to by the word *self* (6). This hypothesis presupposes that there is no acceptable reason for postulating an inactive or unchanging substantive self or soul beyond or underlying these activities in the manner of many scholastic and modern philosophers. The activities are distinguishable aspects, not distinct parts, of the total unitary activity of what I am calling the psychological self.<sup>2</sup>

From birth onward these functions of the self mature and change through learning as the self interacts with the social and physical environment. While much influenced by the kind of environment it has, this psychological self discriminates and selects, within hereditary limits and environmental opportunities, its living adjustments to other selves and

<sup>2</sup>I am using the term *psychological self*, first, because this conception is here being advanced to clarify certain psychological problems, and second, because the philosophical conceptions of the self have invariably considered it to be non-physiological. My discussion here skirts the mind-body problem and defines the self in terms of certain psychological activities, leaving the problem of whether they are 'mental' or 'physiological,' both, or neither, to further analysis.

Perhaps I should add, however, that for psychological and philosophical reasons I am more sympathetic with interactionistic views like that of James (21, p. 414), Calkins (13), Brightman (7, 8, 9), Pratt (30), and McDougall (28) which restrict the term 'self' to the purely mental, rather than with the psychophysically neutral views like that of Stern (33), the isomorphic contentions of the Gestaltists, the 'organismic *neutralism*' with attendant parallelism of J. B. Brown (12), or double-aspect views like H. Murray's (31) or Moore's (29, 30).

However, let our individual theoretical solutions of the mind-body problem differ as they may, the empirical data for the psychologist and philosopher seem to be inter-related knowing-wanting for which mind-body theories must account. These inter-related activities, whatever the final conclusion be as to their 'mental' or 'physiological' components (32), I am calling the psychological self.

things. As a vital part of this adjustment-process, it develops a personality and an ego. The exact meaning of these terms will be discussed in a moment. What needs emphasis here is that the self's thinking, remembering, feeling, wanting, etc., are not identical with the ego and personality (or any developed 'sub-systems'), for these change as the self evaluates its adjustments in a different way.

The activities which constitute this self, such as sensing, remembering, perceiving, imagining, thinking, feeling, and emoting, constitute the 'acts' of man discussed in chapter after chapter of texts in general psychology. There may be debate as to the exact relation between these activities, as to whether these are all the irreducible aspects, as to whether they are completely dependent on bodily activities. There have been fascinating arguments as to what man's essential wants are, and what the sources of his knowledge are, but there has been no denying of knowing and wanting (we telescope the other activities into these two). What we are suggesting is that these processes are phases of one ongoing process which is itself not an abstraction from them but which is they. They are, in Stern's term, a *unitas multiplex* (36) and constitute, in Bergson's sense, *durée réelle*!

The psychological self, then, is a knower and a fighter for ends. And here we find the clue for the unification of the eight different conceptions of egos listed by Allport. As he says (3, p. 459), "the ego has been conceived, viz., (1) as *knower*, (2) as *object* of knowledge, (3) as primordial selfishness, (4) as dominator, (5) as a passive organizer and rationalizer, (6) as a *fighter* for ends, (7) as one segregated behavioral system among others, (8) as a subjective patterning of cultural values." But if we unify the functions of knower and fighter for ends as activities of the psy-



chological self, then the other egos may be seen as possible modes of adjustment by this conative and cognitive self in interaction with the world. They become not egos but properties of the ego which, as we shall see, is the variable region of the personality which the self evaluates. It is a knowing and striving self (I, individual, organism, or person) which knows and preserves itself, be it through selfishness, domination, rationalization, as a particular behavioral system, or as a pattern of cultural values. All of these egos *presuppose* some form of knowing and wanting in their development, alteration, and preservation.<sup>3</sup>

One word should be added perhaps about the self and ego as 'object of knowledge' (2 above). Among the things which the *self* can know as existing is itself,<sup>4</sup> and *in this sense* the self is an object of knowledge. The self knows, in reflective self-consciousness especially, *that* it is knowing, feeling, as well as *what* it is knowing. If the self is an object of knowledge, it may be asked, how does it differ from the ego? Haven't we got the squinting substantive and objective ego back again, and if we have, why not leave the matter there instead of multiplying entities needlessly?

The answer is two-fold. First, the self in knowing itself is itself the knower. The ego in the sense being discussed

here is known but is *never a knower*. It is an object of the knowing-fighting self, but itself is not a knower or fighter. Such expressions as "My ego is hurt" or "My ego won't stand that," suggest that the ego is a knower and a fighter, but they really mean: "I (the self) don't like, and disagree with, the evaluation you are putting on my activities, and what is more I'll fight to prevent your doing that again." In other words, the self can know itself and its relation to the world, and the ego *symbolizes* for the self a *particular evaluation* of that self's predicament. The self knows its ego, as a phase in its adjustment, and fights to maintain it. The adolescent, who knows that his 'place' in the gang's esteem depends in large part upon his ability to 'swat' the ball, or to 'strike 'em out,' will carefully protect that arm and seek to develop that system of abilities on which his 'ego' depends. If conditions change substantially, he may strive to change his ego to the extent desired, as for example, when the problem becomes that of getting into college with most of 'the crowd.'

Thus the second difference between the self and the ego becomes explicit. The ego is the self's evaluation of its activities in the life-situation. The self knows and fights, and can know that it knows and fights, as the ego cannot. But the ego represents the evaluation of the self's activities, influenced of course by the evaluations placed on the self's activities by others. What has been said about the ego will be developed and made clearer after we discuss the relation between the psychological self and the personality, but an analysis of Wallen's experiment, cited by Allport, may here clarify further the need for and function of the self.

Wallen in his experiment (38), 'Ego-Involvement and Selective Forgetting,' discovered that subjects, in recalling ratings of their personality traits after a

<sup>3</sup> As Paul Schilder has said (34): "The individual has to compare again and again, and must not only know that he perceives but must also be aware of his effort in the construction of perception." For the ambiguous word 'individual' I would substitute psychological self, and agree that it brings experiences 'into an ego context.'

<sup>4</sup> Professor Helge Lundholm (26) gives a description of the conditions under which the self expands and contracts. The self as he describes it is an *object* of knowledge. This expansion and contraction of the self's boundaries is, I should say, a function of the cognitive-conative activities of self which finds itself thus contracting and expanding.

period of time, tend to alter them "in such a way as to make them more compatible with subjects' opinion of themselves." The explanation offered for the alteration of these ratings or 'trace-systems' is 'interaction between the ego-field and the trace-system of our material.' In sum, "the similarity between a particular structure in the ego-field and the trace-system of the material [or ratings] must have partially accounted for the substitution of function" (38, pp. 37, 38, 39).

Now, the desirable traits, similar to the ego-system, certainly did not realize their own similarity or 'ego-relatedness' and relate themselves to the ego-system. Nor can the ego-system to which they are assimilated relate them, or see the similarity, for the ego is the subjective standard to which they are related. What, then, *noting* the similarity, relates them? The hypothesis offered to explain such communication is the cognitive-conative psychological self which has certain evaluations of itself (ego), relates other ratings to them, and alters the ratings ego-ward to avoid conflict. Similar considerations would apply to other investigations of this sort (14, 15, 16, 22).

Should we, perhaps, substitute the term self-involvement for ego-involvement in such experiments? The answer is negative, for the purpose of such experiments is to discover what factors influence the self—in the instance cited remembering is influenced by the factor of ego-formations *et cetera*. The self, as Brightman has said, is involved as the presupposition of every experiment (10), and there is no point in referring to self-involvement especially when the psychologist is trying to study the particular course self-activities take. As James said (21, p. 3), about the faculty of memory, so we can say about the self: it "does not exist absolutely but works under conditions and *the*

*quest of the conditions* becomes the psychologist's most interesting task." Note he did not say the *only* task! Intellectual clarity and avoidance of confusion is also a scientific objective. When we overlook the unobtrusive but inescapable self, we tend not only to bring back 'the squint,' but also create the artificial problem of how 'communication' and 'interaction' between aspects of experience can take place. When we forget the self, we tend to reify its 'systems' or aspects, and misplace concreteness by attributing activities to them which belong only to the self.

## II. THE SELF AND ITS PERSONALITY

"Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment" (2, p. 48). In this definition the personality is clearly a function of the undefined 'individual.' Let 'the individual' mean the complex unity of cognitive-conative activities. This is our definition of the self. The definition would therefore read: "A self's personality is its dynamic organization of its own unique psychophysical wants and abilities which renders adjustments to its environment unique." The personality is indeed a *self's* mode of survival, unique because no two selves have the same basic inherited constitution. These adjustments or maladjustments are what they are, in large part, because the acting self is reacting to the world as it perceives, imagines, or conceives that world and as it compares or evaluates the power of its activities and wants in a given socio-geographical situation. The personality a self develops is probably the most important by-product of the self's encounters with the world, for the personality is the particular adjustment the self has *learned* to make to the conceived world.

We need not stress here the impor-

tance of self-consciousness in the development of personality. But, as Allport says, "the advent of self-consciousness is gradual" (2, p. 165). There is consciousness before there is self-consciousness. Whatever the exact nature of the experiences whereby the infant becomes aware of himself as a being distinct from the natural and social environment, consciousness of self presupposes a knowing-wanting self to begin with which as yet was not aware of itself. Nor can there be 'successive moments of consciousness with their imbrication of temporal reference and content' (2, p. 157), unless there is an enduring knowing-wanting self. For a succession of experiences to be known *as a* succession, as consistent or inconsistent, similar or dissimilar, involves an embracing unity persistent through change. If the organization of personality, in particular, 'must be regarded as constantly evolving and changing, as motivational and self-regulating' (2, p. 48), then, unless we are going to have separate and disparate globs of organization following each other, we must have a knowing-wanting self, an associative functioning, to whose destiny these organizations are related, for whom they exist, and by whom they are altered.

The personality, we have seen, represents the accessible organization of the self's functioning in a given world, which endures as long as that self and its environment allow it. But we must not even suggest that the personality is a mere mask which the self can put on or take off at will. For the self in 'determining' one mode of adjustment, in 'selecting' within limits, as it were, its battering ram and its defense, is restricting its activities to certain channels, and may indeed find itself 'stuck' with its own evolved personality. Personality is anchored in a self, but a self's further actions are modified by or anchored to the personality developed.

This conception of a self-personality throws light on the nature of multiple personalities. Dr. Jekyll can switch to Mr. Hyde only because Dr. Jekyll represents one functional system of the knowing-wanting self which cannot at the moment control all of the self's activities including the system represented by Mr. Hyde. But the self's activity is the mediating activity which may curb the development of Dr. Jekyll or Mr. Hyde, or relinquish itself completely to the one adjustment-system.

### III. THE SELF, THE PERSONALITY, AND THE EGO

In his article, Professor Allport suggested that the ego and the personality are not coextensive or identical. The ego "is only one portion, one region . . . of the personality." Again, "Many skills, habits, memories are components of personality but seldom, if ever, become ego-involved" (3, p. 473). The ego, furthermore, 'varies greatly from time to time' and "its content keeps changing, for at certain moments the ego seems preoccupied with one activity and soon thereafter with a wholly different activity" (3, p. 474). (This last clause illustrates the ego's squint, for it is now reified into a knowing agent.)

It is clear from the above that the ego, like the personality, is acquired, and that it is *not an entity* separate from the personality, but a distinguishable *functional unity* within the system of personality. However, there seems to be no answer to the question: Why changes in the ego? Perhaps the functioning of the psychological self can clarify this situation also.

We have seen that the knowing-wanting self, in its interaction with the sociogeographical environment, is forced to extend its functioning in concrete ways (develop abilities, habits, sentiments, attitudes, traits, secondary personalities), which eventually become the self's

more or less organized mode of adjustment, or personality. The personality does not have *independent* thinking-wanting functions, but represents the unique adjustment-system in which a given self has used and is using its inherent energies. The complexity and degree of unity within a given personality, or, in general, the kind of personality developed, indicates the degree of 'success' a given self has had in meeting the demands of the socio-geographical environment with its own intrinsic potentialities. For example, a self may so develop its inherent needs and activities through the years that a genial, trustworthy, industrious, social, and theoretical personality results. However, careful analysis often reveals a growing religious interest also. In other words, the self's investments in life have taken a fairly definite form, but not a final form. At the moment, let us say, this person is an appealing public speaker, but he takes special pride in his capacity for theoretical analysis which experts have praised. If he were asked what he prized most in his personality from the point of view of the public speaking, whereby he earned a good living, he would stand by his geniality and golden voice, but if asked what he prized most in his achievements, he would immediately refer to his analytical ability which experts have admired. It is the analytical ability which constitutes the ego at one point, while the geniality and golden voice, other aspects of his personality, comprise his ego at others. Challenge either, and there will be a persistent attempt to show you how incorrect your evaluation is. In each instance he (the *self*) has identified his long struggle for achievement with the traits (parts of the personality) now questioned. His ego, the self's ego, is involved. Strike at the ego and you indeed strike at the self.

The ego, accordingly, is that portion

of the personality with which the self has identified its greatest value or adjustment-segment at the time (24, p. 73 ff.). The rest of the personality the self may be aware of and evaluate in different ways at different times, depending on where the stress or threatening conflict happens to fall in the total life-situation. For the ego represents a roughly determinable portion of his mode of survival which he evaluates as 'central' and essential to his welfare at the time. Generally speaking, then, the ego will be the core or cluster of values (perhaps actually embodied in traits) with which the self identifies its 'security' or success at the time. When its ego is involved, the self's value-citadel is in question, its investment in life is at stake. That is why what is relevant to the ego produces tensions in the self, for the conflict with or threat to the ego is really conflict with or threat to the self's prized achievement (ego). To say, as Allport says, that there are "two forms of motivation, one ego-involved and one not" (3, p. 469), is to say that in some instances the greatest values conceived by the self are involved, and in other instances less critical needs, segmentally conceived, are involved. "Ego-involved tasks often demand changing goals and new responses" (3, p. 468). When this is true, it is because the self has put a premium on growth. Again, "many cultural frames having to do with language, etiquette, or dress, determine our perceptions, our memory, our conduct, but their influence is not felt as personally relevant!" (3, p. 464). The reason is not that the self does not value them at all but because at the moment they can be taken for granted. But if the situation changes and the connection between them and the security of the self's acknowledged values is clarified, they change their psychological status and become 'personally relevant.'

It will be seen, then, that the ego,



though it may be a fairly stable focus of activity and of further organization in any personality, is not a separable organization in personality. The ego could not be understood unless the personality pattern were understood, though an understanding of the personality pattern at a given time would not be complete without understanding the ego, or the critical-value-complex.

#### IV. THE SELF AS UNIFIER OF SUB-SYSTEMS

Lack of complete understanding, and not of respect, has made me hesitant to relate the psychological self with the concept of the ego as developed by Koffka and Lewin. But what I do comprehend leads me to suspect an underlying squint and lurking disunity in their ego-concept. Professor Koffka stresses the importance of the ego as a unifying, enduring system which maintains "its identity in the stream of varying conditions" and develops "in accordance with the disturbances to which it is exposed and the kind of Ego it is" (23, p. 332). This passage would describe the psychological self admirably if that were all there were to it. But the subjective-objective squint appears as soon as it becomes clear that the ego is itself one type of experience among others: "discomfort may be experienced without an ego" (23, p. 327). At one moment we are told that the ego is segregated and in the next we read: "No Ego could exist, as a special system, unless it *segregated itself* (italics mine) from other systems" (23, p. 328). Can it be that something like the psychological self might fill in the gap which Koffka admits when he says that "we have, at the moment, no real knowledge of the forces which keep the Ego unified and segregated from the rest"? Koffka simply rested at this point with the assumption that the ego is 'a particular field

part in constant interaction with the rest of the field.'

Another resemblance to the psychological self appears when Koffka finds that the ego is a complex of subsystems with a 'permanent sub-system' which he calls 'the Self.' This 'Self' is the core of enveloping sub-systems interacting with each other and with it, comparable to different layers in surface-depth organization. But is this inner self simply the deepest and permanent layer? Are the other systems ultimately unified by its activities, or do they have their own? Are the tensions which originate in the Self related to the tensions in the sub-systems?

Lewin, as if to reply, not only tells us that "a dominant system 'uses' a subordinate system as its tool" (25, p. 101), but that a tension from the 'inner-personal region' may spread throughout the personality. The exact inter-relation is not clarified, and we are not told that these sub-systems are nourished by the inner-personal (as I should contend). It may be that the topographical methodology gets in the way of clarity at this point. Yet, when the inner-personal system is itself said to be differentiated into 'central and peripheral inner-personal systems,' we begin to wonder what the differentiating agent is. To speak of 'a central need' setting up "a peripheral 'quasi-need' as a tool for its fulfillment" (25, p. 105), is meaningless unless it is a linguistic short-cut for something like: "The concrete cognitive-conative self, in order to fulfill one of its most intense or highly valued needs, is forced in a given situation to find a different or devious route for its satisfaction." Better, with Stern, to say "*Keine Gestalt, ohne Gestalter*" (2, p. 553), and to emphasize that the self, as Stern said of the Person, "*is a living whole, individual, unique, striving toward goals, self-contained and yet open to the world around*" it (36). We shall

then more readily realize that the self, its personality, and ego are not like layers of an onion, but one interpenetrating psychological organization.

In closing, one other theoretical consequence emerges which we would here reemphasize (5, 27). Most recent discussion (2, 11, 14, 17, 18, 19, 20, 35) of the formation of personality has labored the enormous part played by the cultural situation in which the individual finds himself. Now, it certainly is impossible to account for the self's development without preponderant attention, perhaps, to the cultural environment. If the self, for example, identifies its well-being with social norms and social objectives, like democracy, then in action this social norm becomes the self's highest ego-value, by which the self judges and controls the future course of its activities. But should these major considerations for the course of development not be more closely connected with the *co-generator* and *co-director* of specific human changes in a personality, namely, the functioning self? After all, it is the activities of this self which create demands for the environment and society to challenge, fulfill, or frustrate (1, 5). The self challenges the culture in which it is born even as it responds to its moulding norms. Thus, the ego and the personality are never merely the 'subjective side of culture.' They are always, in varying degree, the means a self has taken in developing itself among the possibilities suggested to it by the surrounding world. The great abstraction or artifact, psychologically speaking, is the word 'environment' or 'society' in the singular. Every self senses, feels, needs, perceives, and thinks about the stimuli which impinge upon it; it relates them in various ways, but always with some uniqueness, to its own developing conception of itself. For the self stands as the unique active unity, ready to be

influenced and sometimes forced by demands outside itself, but always eking out its own style and mode of adjustment. Indeed, 'society' represents what selves have more or less agreed upon as valuable aims for self-development.

#### SUMMARY

The concept of the *psychological self*, as an enduring, unique, complex unity of knowing-wanting activities, not only serves to unify diverse descriptions of the ego, but to clarify the function of the ego in personality-organization. The adoption of this self, as the agent ever organizing its activities in relatively stable personality patterns and evaluating its adjustments in the light of environmental demands, helps us (1) to understand the close functional relationship between ego, personality, and self, and (2) to explain the possibility of continuity, succession, and interaction within the personality-ego systems.

The self does not, of course, explain the existence of any one system, or any specific development within personality; it has no specific experimental value. But if we experiment in order to improve our understanding and interpretation of human experience, then this interpretative concept may be found useful, even as it may have to be modified or expanded as empirical data pile up.

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# THE PSYCHOLOGY OF THE CORPORATE ACT

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The most difficult problem of social psychology is the psychology of social group behavior or corporate action. Many social psychologies constructed from the individual psychological point of view have stopped short of the reality of the social group, and a few have accepted the concept without attempting to understand or use it. Proceeding from a quite different point of view, some sociologists have dealt with the social group as if it could not be understood in analytical or even psychological terms, as if it appeared fully formed rather than developed, and they have not given much consideration to the psychological aspects of the behavior occurring in it. Even those social psychologists who use the concepts and methods of sociology have failed to present a searching analysis of corporate behavior.

The present paper will attempt to analyze in psychological language the behavior of the social group as an example of social behavior related to but not identical with other forms of group behavior. An attempt will also be made to bridge the gap between concepts of the less integrated forms of social actions and completely integrated group behavior.

Among the incompletely integrated forms of social behavior, and arranged in order from least integrated to most nearly integrated, are found (a) unilateral social behavior, (b) interaction, and (c) unincorporated collective behavior. Unilateral behavior consists of action in which no participant both stimulates and responds to the other participants (2). Interaction is reciprocal social action in which each of

two or more participants acts with reference to stimuli, part of which derive from another organism, but no participant perceives himself and another as being parts of the same combination (3). Unincorporated collective behavior is behavior of a plural number of individuals who are influenced by one another and participate in action involving their collective relationship (3).

For the purpose of the present analysis there is only one class of social behavior in which complete integration exists. It is a form of collective behavior in which the participants are incorporated into a unit. Such activity has come to be known as corporate collective action or corporate behavior. It is *behavior of a plural number of members who are influenced by one another and who collaborate as a unit in actions with reference to the environment.*

The following list indicates the relationships between the four main classes of social behavior described above:

- A. Unilateral behavior
- B. Reciprocal behavior
  - 1. Interaction
  - 2. Collective behavior
    - a. Unincorporated
    - b. Corporate behavior.

The most important distinctions between unincorporated collective behavior and corporate behavior are found in (a) 'individuals' influencing each other, as opposed to 'members' exerting mutual influence, and in (b) 'participation as individuals,' as opposed to 'collaboration as a unit acting with reference to the environment.' Participants in unincorporated collective behavior remain psychologically separate and act overtly



along separate lines toward a common goal, while participants in corporate behavior are psychologically inseparable and act as one unit with reference to the surrounding situation.

By its nature corporate behavior approaches the behavior of an organism acting with reference to the environment. Biological corporateness of human beings remains impossible, but a degree of psychological incorporation is found in all corporate behavior. As with all other behavior, there are two aspects of psychological corporateness, the *observable part* involving movements with reference to the environment, and the *experiential part* involving impulse, perception and mental manipulation (memory, imagination, thought). Instances of the overt aspect include the delivery of a decision of a court consisting of multiple justices, the issuance of a military order through the levels of command to the smallest fighting units, an executive order, a corporation financial statement, a union order to strike. On the covert side are such phenomena as group consciousness, group prejudice, ethnocentrism, esprit de corps, rapport, and morale.

Also, as with all other behavior of the more complex organisms, each act of a unified social organization may be thought of as a dynamic system with distinguishable phases, some overt and some covert, carried out by interacting members. Each corporate act may be said to have impulse, perception, manipulation and attainment phases (1). It is possible for the sociologist to ignore the internal organization of each of these phases of the corporate unit, just as it is possible for the social psychologist to ignore the internal structure and action of the organism engaged in the behavior-act. However, since the elements of the corporate group are biologically separate organisms, the problem of internal organization is a very important one. In

the case of the corporate social act the social psychologist is as much interested in how the whole acts internally as he is in the externally directed action. And he should be as much interested in internal organization and action as the individual psychologist is in the individual organism. Therefore, it is pertinent to consider the processes of stimulation, perception of implication of a situation, perception of possible goals of action, selection of a goal, perception of how to reach the goal, adjustive action toward the goal (equivalent to manipulation in the individual act), and attainment or execution of the action. It is obvious that these various phases are closely related to the social nature of the situation in which the corporate unit finds itself, but for the present they will be discussed only in general terms.

The corporate organization admittedly has no nervous system or sense organs which are not those of its organic parts. It is equally true that the parts of a social organization are not constantly articulated for mutual interaction. However, the nature of each member of an organization is such that he may receive impulses from outside that system, and he is capable of transmitting them to other members of that system. Children, the mentally diseased, the mentally defective and the senile may not be able to perform this function, but almost everyone who is a member of a corporate group has the ability to receive impulses from outside the group and to transmit them to other members by the various means of communication, both natural and artificial, which have been developed by human beings.

However, the possession of a general ability to receive impulses and transmit them to other individuals is not enough to account for this phase of corporate action. The ability to receive impulses that have group rather than individual

significance is not an undeveloped, natural or instinctive possession. It depends on the development in the individual of a sense of the group in relation to its members, as well as a sense of the relationship of the group to the non-group world. In the absence of this ability, which can be developed only by participation in collective behavior, impulses are perceived only in individual terms and will tend to be transmitted only in such terms. That is to say, the point of view of the initial perceiver may be individual rather than collective and in such a case the behavior is not corporate. But the initially perceiving individual or the individual to whom the impulse is transmitted may perceive it to be significant to a corporate unit and therefore transmit it as a part of corporate behavior. Even his perception of an impulse as corporate gives it a corporate quality, but this perception is insufficient to make the phenomenon completely corporate, for action is not corporate unless two or more participants perceive the situation and action to have a corporate quality.

It follows from what has been said in the previous paragraph that an impulse is not fully corporate until it has been perceived to be corporate by an individual and functions through transmission to and perception by at least one other as an impulse contributing to action by a corporate unit with reference to the environment. In this respect the corporate act is functionally similar to an act of an individual. In the latter an activated sensory neuron and association neuron combine to produce disequilibrium and contribute the beginning stage of an act. In the first stage of the corporate act one member of the group receives an impulse, reacts to it and transmits it to another member, producing disequilibrium in the group.

It is obvious that reception of impulses which come to be fully corporate

is conditional on perception of their corporate reference. This fact means that reception is selective and possible only to individuals possessing certain perceptive qualities. The same perceptive qualities must also be possessed by other members who participate in corporate behavior. It may appear confusing to say that reception at the corporate level rests on perception, but there is no necessity for misunderstanding on this point. Perception on the relatively simple level of individual behavior is prerequisite to reception of a corporate impulse as corporate, because corporate behavior is on a more complex level than individual behavior.

Although all stages of corporate behavior involve perception by members, and although all members of a corporate unit possess the fundamental ability to receive impulses that affect the equilibrium of such units, it does not follow that there is no differentiation of function which limits the number of individuals in the corporate group whose primary and chief function is to receive impulses. The character of the organization sets limits on the reception of impulses and also affects their transmission. Through native ability and/or training some individuals are more proficient in corporate reception than others and more skilled in transmission of impulses than in their reception. In an army all soldiers are not equally good at scouting, and the scout is not necessarily as proficient a transmitter of information as the soldier in the signal corps, or one who acts as a messenger. There is even an entire branch of each armed force, the intelligence branch, that performs the functions of gathering and transmitting information obtained from outside the unit. Members of this service are not readily interchangeable with combat or supply personnel and *vice versa*.

Perhaps even more important is the

organization of the corporate unit so that the transmission of impulses is channelized in certain ways. Each organization has its own rules governing the transmission of information, commands or instructions. A simple example is a caste or rigid class system which makes a master ignore the report of a slave as 'slave imagination' or of a servant as 'below stairs gossip.' As a rule a reporter ignores the information a typesetter might give him. And in the more complex social units no attention is paid to information obtained from any except expected quarters. Attempts to avoid channels are discouraged, prohibited or simply given no attention. A person with information of a sort not expected of him finds it necessary to send it through acceptable channels and hope the people to whom it is entrusted will transmit it quickly and accurately and give him credit for his contribution. In other words, although practically all human beings can receive and transmit information of value to social groups, the organization of many groups prevents this from being done easily, directly and efficiently, it being a common belief that specialization even in this respect adds to the efficiency of the group in the long run.

The corporate group not only consists of members, each of whom is capable of perceiving corporate phenomena, but each corporate act also depends upon behavior which performs the same function in the corporate act that complex perception performs in the individual unit of behavior. The group must perceive the general situation, the specific new circumstance, the relation of these to each other and to the already existing goal of the organization and its plan of reaching the goal. When we say the group is faced with these tasks of perception, however, we tend to ignore the differentiation of membership. As with receptivity and transmission of stimula-

tion, there is specialization of perceptive function, but here the specialization is incomparably greater. Although a very high proportion of group members can receive stimulation from sources external to the group and transmit it to others, only relatively few people are able to perceive accurately the implication of this knowledge for the group. This is particularly true in the larger social units, such as business corporations and political states.

Part of the cause of restricted perception is a lack of intellectual ability to grasp complicated problems of relationships of parts of an organization at any one time or to relate immediate circumstances to imaginary future situations. Part is the priority of private interests over corporate interests. And part is clearly the training and education which have indirectly prevented the use of such ability and interest as might be possessed. But most of the cause is the existence of group authority vested in leaders, administrators, governors or executives who are given the responsibility of performing the perceptive functions of the group and who establish roles and functions of all members in the organization.

So long as a group has powerful directors able to make their own interpretations or to command the perceptive ability of such specialists as a 'brain trust,' the group can function perfectly well without every member being able to understand corporate problems, just as no group needs to receive impulses through all of its membership. What is generally called the executive part of a social organization is ordinarily expected to possess the highest perceptive ability as well, but this is not necessarily true. Thus, in government, and in the largest business corporations, the executive, who is analogous to the center of muscular or motor control in the individual organism, may rely on expert perceptive

minds, research analysts, economic advisers, statisticians or other experts. In smaller units it is obvious that the leadership will not require such differentiation; the perceptive and executive center may therefore be one, and the man or group must combine both planning and executive qualities.

After the corporate unit has perceived the circumstances with which it is faced it must plan and decide before it can successfully carry out a corporate act involving adjustment to the environment. Although perception of situation, planning and decision are usually closely identified and practically inseparable, they are theoretically quite distinct. Perception of the situation generally refers to a difficulty which motivates toward action. This step must precede decision and generally precedes the formulation of a plan. However, specialists in planning may have many plans already prepared before problem situations arise. A military staff constitutes one of the most outstanding examples. But even when a plan is prepared in advance it usually is necessary not only to decide to use it but also to make minor changes in it in order to fit it to the needs of the group in the general situation that has developed.

Unlike the individual organism which perceives complex relationships by means of the combined action of a large number of nerve cells, small scale corporate perception can be carried out by one person. Perception of complex relationships by an individual involves co-ordination of a number and variety of immediate sensations, memory images, and combinations of memory images into a single pattern having implications for behavior. An individual human being who is able to perceive the co-ordinated elements of an individual's total situation may perform the same function for a corporate unit's total situation, particularly if it is small and/or rela-

tively simple. Some groups, and their problems, are smaller than others and can be comprehended more readily than others. The largest groups cannot be served adequately by minds unable to perceive only a few facts. And even the greatest perceptive talents are put under too great a strain when they attempt to co-ordinate all of the details of a large and complex group into a single whole. The only way in which the situation of a large corporate unit can be adequately perceived is by means of simplification of the elements to be incorporated. This can most readily be accomplished by departmentalizing operations, and requiring reports from all departments which may then be co-ordinated by the chief of the whole organization or by anyone of a number of people having access to all of the information in the simplified form. Such devices as maps, charts, diagrams, pictographs and statistical tables are also powerful aids to perception.

When a number of individuals are able to obtain information about a large portion of the activities of a group diverse and conflicting perceptions tend to result. Such a state of affairs is akin to the mental disorganization of a person with conflicting perceptions, such as delusions, or hallucinations, which paralyze the intelligence of the whole and prevent adjustment to the environment. The paralysis of a corporate unit is the penalty paid by the group for containing a number of unco-ordinated perceivers. It is such conflict and resulting paralysis of social systems permitting freedom of opinion and speech that dictatorships count on as aids in wars against democracies. Several methods are generally used to avoid the serious effects of divergence in corporate perception, including censorship, interference with freedom of travel, and the substitution of propaganda for accurate information. These methods interfere both with un-



desired perceptions and also with communication of facts so perceived along channels which the leadership of the group desires to obstruct.

The way in which a corporate unit decides what it shall attempt to do, what goal it shall seek to reach and what means it shall employ is determined to a great extent by its organization and its devices of internal control. In absolutist forms of organization one man may make the decision. Or absolute power may be vested in the hands of a small group of directors, a cabinet, a board of generals. Or a large representative body, such as the House of Commons, or a Congress, may make the decisions, which are enforced by police officers and courts, with the support of the customs and mores. In the case of individual decision the leader may have a group of advisors, he may seek advice in separate conferences or he may make his own decisions. In the last case, usually of limited value for large groups because of the rivalry and the strength of subordinate leaders, the group decision is identical with the leader's decision. In all cases except where a single leader makes decisions without advice the decision is the result of compromise and adjustment. And in the extreme case of dictatorship there usually is a small amount of discussion among a small clique which uses its absolute powers as the basis of integration. In such a case the wills of other people are adjusted to a decision already made.

In the case of large group decision resulting from conference and discussion an attempt is made to produce consensus by indirect means. Efforts are made to exert pressure on a delegate or member of the governing circle and mold his opinion. Private individuals working singly express their opinions and desires by letter, telephone or telegraph. Small groups organize and direct their influence jointly in any way in which they

may reach the body of deciders. The press, radio, motion pictures are used. Propaganda, advertising, gossip, news, argument, and emotional appeals will be the instruments and methods employed. There will be speeches, public meetings, petitions. A lobbying group may be established with a permanent organization. Political life under a parliamentary system is the best example of the process on an extensive scale, because of the large number of people engaged in every decision of national or statewide significance. But a good deal of the same sort of thing is seen in social clubs and other organizations, business units in no sense being immune.

In the same way that the various parts of the individual organism do not make identical contributions when the organism acts with reference to the environment, so the members of the social group are differentiated in their actions toward the outside world. In some cases, usually the actions of small groups, each member carries out similar muscular manipulations with reference to the environment, but in larger corporate units some representative individual or subgroup acts for the whole with the sanction of that whole. The sanction may have developed through discussion, education, propaganda and general uncoerced agreement, or the leadership may rest on the threat of a force too great for active dissension on the part of an enslaved people, or upon customs and tradition.

The character of the group representative varies with the character of the instruments and methods employed in overt action. Where the group communicates its will or exerts its influence on a respondent individual or a group, by means of symbols, such as diplomatic proposals, requests for information, warnings, ultimatums, declarations of embargo or declarations of war, a single person may carry out the overt response.

But when nonsymbolic behavior is required to control the respondent, the combined effort of a number of people executes the group will. Army, navy and air force play such roles today, interfering with the actions of other units, destroying them or forcing them to yield. But with these representatives of groups, as with civil representatives, symbolic communications must be resorted to, however, when it comes to terms of surrender and armistices; they must be carried out in a person-to-person manner by individuals acting as representatives of groups.

Business units, religious groups and other organized bodies of people exhibit the same sort of corporate action as political states, except that symbolic means are the only legally sanctioned ones in these other cases. The modern state has retained the sole right to legal physical coercion. This right is violated on occasion, but usually only in minor details and is always subject to reprisals by the state. The business corporation and the city, as is true of the symbolic action of a government, employ as the expression of group will the *executive order* by means of which a delegated person (president, executive vice-president or someone delegated by him) puts into operation the procedure agreed on by the deciding members of the group or their representatives. In the United States, the executive branch of government puts into operation laws passed by the legislative branch, which in turn represents the mass of the population permitted to select the legislators. In some corporate units the executive is the head of the policy and rule-making body, as in the business corporation. And in many cases he practically dominates this group. The separation of powers in corporate units exhibits almost every conceivable combination, from complete lack of separation in the dictatorship or the executive-owned business to

complete separation, as in the United States government, where legislators include none of the executive branch and the executive branch contains none of the legislators.

Since, as a rule, the representative of every large group acts simply to execute the group will as if he were an individual acting in indirect relationships, he will vary his behavior to meet the demands of the situation with which he is confronted. Often the executive is given little discretion and must wait for further decisions before he can act. Such a person is a mere functionary and of little importance. However, most executives have wide powers, especially during emergencies, and proceed in what appears to be the best way, but by varying the instruments and methods of influence as conditions indicate. This may readily be characterized as corporate trial-and-error or manipulative behavior. The military leader, in particular, must have a free hand to adapt himself to conditions, only part of which he is responsible for. And the same thing is true of other group representatives in the unstable social situations of national or corporate emergency. The situation is similar when the group desire is ready to be attained. The representative is able to play the role of the group by acting as an individual in drawing up terms of agreement between groups (for a merger, a lease, a treaty or trade agreement) and finally, after an intervening period of discussion and support by the group or its representatives, as when the Senate ratifies a United States treaty, in affixing a signature as the authorized representative of the group.

Throughout its behavior, then, the corporate social group recalls the social action of the individual. The group can receive impulses, and these can be transmitted throughout the unit, but direct transmission is limited to those to whom

the impulses have meaning, that is, to those who understand them to be significant. Intelligent members of the group are able to perceive the implication of the social situation, the goal of the group and how this can be reached. The whole membership, or its delegated representative body, next agrees on what is to be done. And, finally, a group act is executed by representatives who employ either symbolic or physical controls, by either a stereotyped or an adjustable method, in order to influence one or more material objects in the environment, or some other social unit, either individual or group.

It is constantly necessary to recognize that the analysis of corporate behavior presented above is an oversimplification. The whole process can only be carried on by two or more human beings with superior powers of perception, and able to communicate readily with others, to perceive many and varied items which they can coördinate perceptively, and to plan, decide and either execute or supervise the execution of actions sanctioned by the group. At every stage of the process of corporate behavior participating members are acting as individual organisms in terms of equilibrium → impulse → perception → manipulation → attainment → equilibrium, although each of these units of action only constitutes a portion of the total corporate act. The role of the member is to execute his act in such a way as to regain equilibrium without at the same time carrying out in his own person all of the activities of the whole group. This is true even of the dictatorial leader.

In this connection some examples of the complex individual and social behavior unit within the larger corporate unit may be examined to advantage. The reporter on a newspaper may discover a news story and transmit it by telephone to a rewrite man after telling the city editor about it briefly. In such

a case the impulse received by the reporter is a news story which he perceives to be valuable to his paper. His goals are various, but interdependent: to make a contribution to the paper, to get a raise, to get personal satisfaction, etc. He perceives these goals and the means to them through communicating the news story to the editor and rewrite man. When this is done by mental and muscular manipulation his own equilibrium is restored. The reactions of the others contribute to his attainment of equilibrium. He in turn gives an impulse to the others which leads to perception of the value of the information and a feeling of satisfaction on the part of the editor which also helps him attain his personal, as well as the newspaper's goal. His communication to the rewrite man acts as impulse to the latter and contributes to the rewrite man's attainment of his goals. Perception and manipulation are used by the rewrite man also. The various actions of these individuals do not begin and end at the same time but all are examples of behavior-acts functioning as parts of the corporate act of publishing a newspaper. They constitute but part of the impulse, transmission, perception, manipulation phases of the action of newspaper publishing for one issue. But they demonstrate the applicability of the approach to corporate behavior presented here and suggest its applicability to all forms of the most complex group activity.

The fact that the different participants in the corporate act do not begin and end their activities simultaneously and do not perform the same overt actions has important implications for the sociologist and social psychologist. The contribution of each participant to a corporate act is difficult to ascertain and more difficult to observe or otherwise subject to methodical study. To the difficulties of observation that are inherent in any psychological phenome-

non, such as perception, are added in this case the temporal and spatial extensiveness of corporate behavior which can only be comprehended by a person with wide experience in participating in and observing corporate social systems. A thorough analysis of the difficulties of observation of social behavior will be required before the character of these difficulties will be fully understood.

Unfortunately, the effect of the complexity of corporate behavior on almost everyone associated with it is to bring about a serious simplification of thinking about its participants, processes and accomplishments. One of the most striking examples of the effect of oversimplification is the tendency of many students of history and sociology to concentrate their attention on the chief symbolic figure, the ruler, president, or dictator, and on his public deeds and utterances, to the practical exclusion of everyone and everything else concerned with the corporate group. The great man interpretation of history is the extreme example of this form of simplification.

At the other extreme, also a form of simplification, is found the personification of the mass, crowd or other undifferentiated abstraction. This view is much more defensible, and is held by all social scientists, because it is only by thinking of plural numbers of interrelated and organized people as units

that larger human affairs may be dealt with by historians, social scientists, politicians and other interpreters of such affairs. However, it remains important for the social psychologist to possess a system of ideas capable of articulating the interests of the psychologists in the behavior of individual organisms with those of the social scientist in the behavior of social groups (4). Functioning as he does, as a liaison between psychology and sociology, he not only needs to be able to speak their language but also to be able to bring each to understand the habits of thought and ideas of the other. This purpose, we believe, can be attained only through such approach as that presented here, which is both an extension of individual psychology and a step toward realistic and full (5) analysis of generic corporate behavior.

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## THE REPRODUCTIVE BEGINNINGS OF ALTRUISM

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Evolutionists who adhere consistently to their faith must hold that everything in our make-up was derived from something different, and this again from something more different, and so on, back to very simple beginnings. If genuine altruism exists (and of this more later) the evolutionist must look upon it as the product of a long period of development. The lower invertebrate animals do not exhibit the least trace of unselfish behavior. Somewhere in the course of evolution altruism must have entered upon the scene. How and why did it come to exist? From what did it spring?

It may be objected, however, that there is no such thing as true altruism; that what appears to be such is really only a more or less disguised form of self seeking. The philosopher Hobbes declared that "No man giveth but with intention of good to himself, because gift is voluntary; and of all voluntary acts the object to every man is his own pleasure." Similar sentiments, though rather less baldly stated, have been expressed by Bentham and other exponents of a hedonistic ethics. Many psychologists of the associationist school have attempted to show how our sympathetic and kindly emotions were built up through the accumulation of simpler sensory experiences. Professor Bain, for instance, advanced the theory that maternal love is derived from the pleasing sensations of touch received from handling the soft bodies of infants, and would thus resolve the most seemingly unselfish of sentiments into egoistic satisfactions on the sensory level. For the school to which Bain belonged the principle of association afforded a sort of

alchemy by which the baser elements of sensation could be transmuted into the gold of the higher moral sentiments.

Certain skeptical or cynical philosophers such as Mandeville, La Mettrie, d'Holbach, Helvetius and La Rochefoucauld would give man no credit for being actuated by any motive higher than enlightened self interest. With the exposure of the errors of associationism and the development of a more adequate psychological analysis, the conceptions of human motivation that were entertained by the philosophers referred to have largely given way to views which are less derogatory to man's nature. In the light of comparative psychology genuine altruism may be regarded, not as something concocted out of one's individual experience, but as a deep-seated trait resting upon basic instincts that go far down in the animal kingdom. For all social animals altruism has a very real value in the struggle for existence. Animal societies everywhere are mutual benefit associations, and the altruistic instincts which make for social solidarity and effective coöperation would be favored by natural selection as well as variations that aid the individual *per se*. Instincts leading to unselfish behavior are just as basic, therefore, as any other manifestation of life.

The earliest form of overt altruism is found in the care of parents for offspring. When parental care first appeared in the animal world it marked the origin of a great new epoch in the evolution of life. But how, it may be asked, did animals first come to be solicitous about their offspring? If this was the beginning of altruism are we not compelled to derive altruism somehow from

antecedent egoistic activities? My answer is No, notwithstanding the fact that nearly all of the lower invertebrate animals, and also most insects, do not concern themselves in the least about their progeny, or manifest the least awareness of their existence. Although parental care obviously must have evolved from other kinds of activity, it does not follow that these activities were concerned entirely with individual welfare.

When we endeavor to follow the evolution of almost any activity in the animal kingdom we find that it becomes more complicated through the development of other activities that conduce to its more effective operation. The fundamental function of absorbing food, for instance, early became associated with the process of digestion which prepares food for absorption. To facilitate digestion various activities are added such as chewing, swallowing and the peristaltic movements of the stomach and intestines. And in order that animals might have something to chew and swallow they have evolved structures and instincts for capturing and overcoming prey. Subservient to the capture of prey the spiders have added their marvellous instinct of web-spinning with all the complex mechanisms involved in its performance.

In the course of evolution life grows more complex by the addition of activity B subservient to A, of C subservient to B, and of D subservient to C, and so on to the web-spinning of the spider which is a very indirect accessory to the absorption of food. Complications pile up in much the same way during the evolution of reproductive behavior, the final flowering of which has come to be the concern of the moral philosopher.<sup>1</sup> To the simple vegetative function of pro-

ducing eggs and sperms and discharging them into the water where their union is left to chance, there come to be associated instincts of mating with often elaborate organs for insuring the fertilization of the eggs; and subsidiary to mating we have the instincts of courtship, the song of the nightingale and the gaudy plumage of the peacock's tail. Simple egg-laying comes to involve preparatory activities, such as making nests, and also instincts for guarding or incubating eggs. The solitary bee, *Osmia*, digs a hole in the ground, provisions it with pollen and honey, lays an egg upon her store, fills up her hole with dirt and leaves her future progeny to its fate. The female yellow jacket constructs a more elaborate nest of paper cells, stores then with bits of chewed up insects, but after her eggs hatch she continues to bring food to her larvae which protrude their heads like young birds to receive the food. Here by a simple extension of the function of supplying food successive generations which are quite separated in the solitary bee are brought together and the parent ministers to present instead of the future needs of her offspring.

Among the insects there are many transitional stages between blind, instinctive preparations for future progeny which are never seen and active care for the needs of the present generation. Parental care may thus be looked upon as part and parcel of the varied accessory reproductive activities which have been superadded to the original function to insure its success. Although most fishes simply discharge their eggs into the water, some species construct nests, and in a few forms such as the dog-fish, *Amia*, and the sticklebacks, the male guards not only the nest but also the young brood for a short time after it hatches. The whole class of amphibians do not show any concern for their progeny, and the reptiles are not

<sup>1</sup> For a further description of this process see S. J. Holmes, How life becomes complex. *Sci. Mon.*, 1942, 54, 57-65.

much better. Among the vertebrates it is only in the birds and mammals that parental care has become a characteristic of entire classes. With them there are strong indications of affection toward the young as contrasted with the stereotyped behavior shown by insects which, for anything we know, may be as devoid of kindly feeling as so many Frankenstein monsters.

When we trace altruistic behavior back to its beginning in the domestic group and interpret parental care as an outgrowth of instincts subsidiary to the basic function of reproduction, we are not deriving altruism from egoism, as many critics have contended the evolutionist is compelled to do. This for the reason that reproduction is an essentially altruistic function in that it is primarily concerned, not with the welfare of the individual, but with that of others that arise from it. We may regard it as the basic altruistic activity from which all the others are the lineal descendants. Altruism and egoism are coeval and as old as life itself.

Aristotle has stated that all life is concerned with the realization of two ends, the preservation of the individual and the perpetuation of its race. Egoism and altruism have their roots in these two life activities. The realization of both these ends at once is a matter of difficulty for many organisms, and various compromises are resorted to for keeping the one process from interfering unduly with the other. Among birds much vital energy goes into the production of eggs, the building of nests, the tedious task of incubation, and often a long period of feeding, brooding and protecting the fledglings. In the mammals there is the physiological burden of gestation, the ordeal of delivery, the production of milk, and the activities of caring for and protecting the young. All these performances not only impose

extra physiological burdens, but they often entail dangers not ordinarily encountered. But there are some organisms in which reproduction involves much greater sacrifices. The female thread worm, *Rhabdonema nigrovenosa*, produces eggs which are hatched in her body, and the young worms proceed to devour her internal organs and then eat their way out. Here matricide is a normal and necessary event in the propagation of the species. With the human female the situation is not nearly so bad, although it has its dangers.

Nature has never been chary in sacrificing the individual to the interests of the species. "So careful of the type she seems, so careless of the single life," she treats individuals as pawns in her game in which her objective appears to be to have as many children as possible. Hence she has compelled her children to behave altruistically and she has started altruism on a purely physiological level. Although in effecting her compromises between the frequently antagonistic processes of genesis and individuation she has often proceeded in a ruthless fashion, she has also pursued the more acceptable tactics of offering rewards. She has endowed human beings, like the animals, with strong instincts of sex. She has made men and maids to fall in love and to seek their greatest happiness in the close associations of family life. She has bribed the human mother into undergoing the drudging labors of caring for her infants by making her love to minister to their comfort and welfare. Nature has paid for the kind of altruistic behavior she seems most interested in by rewarding it with egoistic satisfactions. Man, unlike his remote progenitors, has acquired intelligence and is able to choose his objectives. Hence if he subordinates himself sufficiently to Nature's ends he has to be paid for it. Although Nature

is sometimes cruel she has not been niggardly in bestowing her favors on her obedient children.

Although man is a social animal he has lived far longer in small quarrelling clans than in highly organized societies. He is much less social than the ants and the termites, and retains a relatively large ingredient of unsubordinated egoism, which is to be expected from the mildly social animals from which he sprang. As compared with most species man has had for various reasons an unusually hard time in adjusting the rival claims of egoism and altruism. His early codes of morals were shaped by the exigencies of life in small groups whose relations to other groups were often hostile. Hence among primitive peoples an act is commonly viewed very differently depending upon whether it affects individuals within or without the tribe. As Hobhouse has remarked, "Morality in its origin is group morality," and Westermarck states that "Savages carefully distinguish between an act of homicide committed within their own country and one where the victim is a stranger. Whilst the former is under ordinary circumstances disapproved of, the latter is in most cases allowed, and often regarded as praiseworthy."

This dual code of morals, which has prevailed widely among the peoples of the earth, is a perfectly natural out-

growth of the struggle for existence among social groups. Peoples praise the qualities that make for tribal success. They extol bravery, generosity, kindness one to the other, and, above all, group loyalty. The valiant warrior, kindly to his own, but a terrible scourge to his enemies, has always been regarded as the hero of heroes. Primitive morality, to say nothing of the morality of more advanced societies, bears a strong imprint of the clannishness which is exhibited by human beings and animals for essentially the same reasons.

Our outlook on human nature is very different from what it was a century ago. Macaulay expressed a not uncommon opinion in his day when in answer to the question "What proposition is there respecting human nature which is absolutely and universally true?" he replied "We know of only one; and that is not only true, but identical; that men always act from self-interest." It is now quite clear that the one general statement about human nature that Macaulay felt certain about is wrong. And many other opinions about human nature accepted by Macaulay's contemporaries are also wrong. Yes, man is truly altruistic; but there are curious features of his altruism that we can properly understand only by following the long and singular course of its evolution.



## RAYMOND ROYCE WILLOUGHBY: 1896-1944

In the passing of Raymond Royce Willoughby on October 3, 1944, the science and profession of psychology lost one of its finest characters and one of its most versatile practitioners. Willoughby's interests were broad. His 68 published papers covered many topics, such as statistical studies of homogenous mating in the toad and in man, a review of sexual behavior in the second decade of life, and contributions of both theoretical and therapeutic import to dynamic psychology. He was probably best known for his work on psychological publications. He played a significant role in the development of the *Psychological Abstracts*, of which he was the first assistant editor and on which he worked for fourteen years. But to Willoughby these public contributions were much less satisfying than those he could make by giving psychotherapeutic aid to troubled individuals.

Raymond Royce Willoughby was born on April 20, 1896, in New Haven, Connecticut. His parents were Imogene Whitney and Raymond Howard Willoughby, both of pre-Revolution stock. Raymond was their only child. Some time during his early boyhood the family moved to New Britain. There Ray graduated from the New Britain High School in 1912. One of the yearbook pictures of that high school shows him with his chess club. This club was a source of pride to Ray, for every member later earned a doctoral degree. Shortly after his graduation his mother died of a malignant carcinoma. Ray took a post-graduate course in high school and simultaneously worked as a reporter and proofreader for the *New Britain Herald*. He saved his earnings for college. In the fall of 1914 he entered the Massachusetts Agricultural College. After some training in the R.O.T.C., he went on active duty in

1917 as a second lieutenant. His last job in the army was mustering out the men in his company. After the war he returned to the Massachusetts Agricultural College where he received his Sc.B. in 1919. After a short period of graduate work at Harvard, Willoughby turned to teaching. For three years he taught science and mathematics at the Berkshire School for Boys. In 1922 he crossed the continent to continue his education with graduate work in psychology at Stanford University under L. M. Terman. There he received the A.M. degree in 1923 and the Ph.D. in 1926.

His first publication was with Terman *et al.* in the famous *Genetic Studies of Genius*. Many of his later papers also show Terman's influence since they were concerned with such topics as the effects of differential birth rate and of cross-cousin marriages on measurable abilities and traits. But a second core of interest also started while he was at Stanford. He was psychoanalyzed by Dr. Moxon of San Francisco. By 1930 his papers began to show the effects of this influence. First appeared discussions of social variables, and then came psychotherapy and dynamic psychology. These were to remain his chief interests to the end of his life. In April of 1944 he sent one of us (Hunt) and Hobart Mowrer drafts of a paper on 'A tension theory of anxiety' which will be published posthumously. Incidentally, since Willoughby often wrote in a compact style, the average reader was apt to glide over his keen observations without appreciating them fully.

Many of Willoughby's professional contributions were relatively unrelated to his specific scientific and therapeutic interests. In the fall of 1926 he was called to Worcester, Massachusetts, and Clark University to accept the assistant

editorship of the *Psychological Index* and of the *Psychological Abstracts* which had just been organized. In 1930 Willoughby was advanced to Associate Editor and made a member of the American Psychological Association's Committee on Publications. A decade after its establishment, the *Psychological Abstracts* was moved to Brown University in Providence, R. I. Willoughby and his family moved with the journal. By this time, however, the *Psychological Abstracts* had reached a stabilized position and no longer offered sufficient challenge to Willoughby. Hence, in 1940, he accepted the position of Chief of the Division of Research and Statistics in the Rhode Island State Department of Social Welfare. Here again, however, his professional job was not central to his scientific interests. He was immediately impressed by the inadequacy of data concerning the incidence of mental deficiency and promptly started the difficult task of collecting the information for a state-wide registry of mentally deficient persons. As recently as May 12, 1944, when he was in considerable pain, Willoughby traveled to Philadelphia to present a paper on his mental deficiency registry before the American Association for Mental Deficiency.<sup>1</sup> Unfortunately his death prevented the completion of this project.

Besides his scientific and his professional contributions in publications and in social statistics, Willoughby did a large amount of individual psychotherapy. During the years at Worcester he had a small professional psychotherapeutic practice. But a larger number of people received the benefits of his therapeutic skill informally and gratis. Graduate students, colleagues, and neighbors continually came to him for help. At

one point in this portion of his career Willoughby got interested in shortening the psychoanalytic process. He published a paper giving the results of a number of short psychoanalyses. In Providence Willoughby dropped his professional psychotherapy, but friends and acquaintances continued to come for help, and he gave it. He was always concerned with the disparity between the needs for such aid and the amount of it which was available. During his last two years he found a typically original way to increase the supply. He collected a small group of Protestant ministers and taught them psychotherapeutic technique and the theory of dynamic psychology. The teaching process itself was an experiment. First these men watched Willoughby in interviews and then later conducted their own interviews, but they brought the procedure and content to Willoughby for discussion.

No description of Ray Willoughby would be complete without some mention of his family life, for it was a great source of satisfaction and strength. While at Stanford he met and married Miranda Goodrie. Their four children (Joan, Allen, Hugh, and Anne) found that he was never too busy to share their troubles or their projects. Above all, he taught them to know and to love Nature and Man.

Raymond Royce Willoughby was actively engaged in following his interests to the very end. This may be partly due to the fact that he did not know he was fatally ill with cancer. But he knew he was ill, and he had decided that he could not let illness stop him. In the summer of 1943 he attended courses in statistics at Iowa State College of Agriculture. In the spring of 1944 he attended a course in Industrial Statistics at Rhode Island State College. Even after he was bedridden and knew definitely that his days were few, he con-

<sup>1</sup> R. R. Willoughby, Rhode Island's experiment in registration. *Amer. J. ment. Defic.*, 1945 (in press).

tinued to counsel with his friends, the ministers, about individuals they were helping. In the last few weeks of his life people whom he had not seen in fifteen years wrote him in appreciation of what he had done for their personal happiness. Most of these letters came from people whom he had helped infor-

mally, but those whom he had helped professionally also wrote. For Ray Willoughby these letters and his family lent significance to his life.

J. McV. HUNT

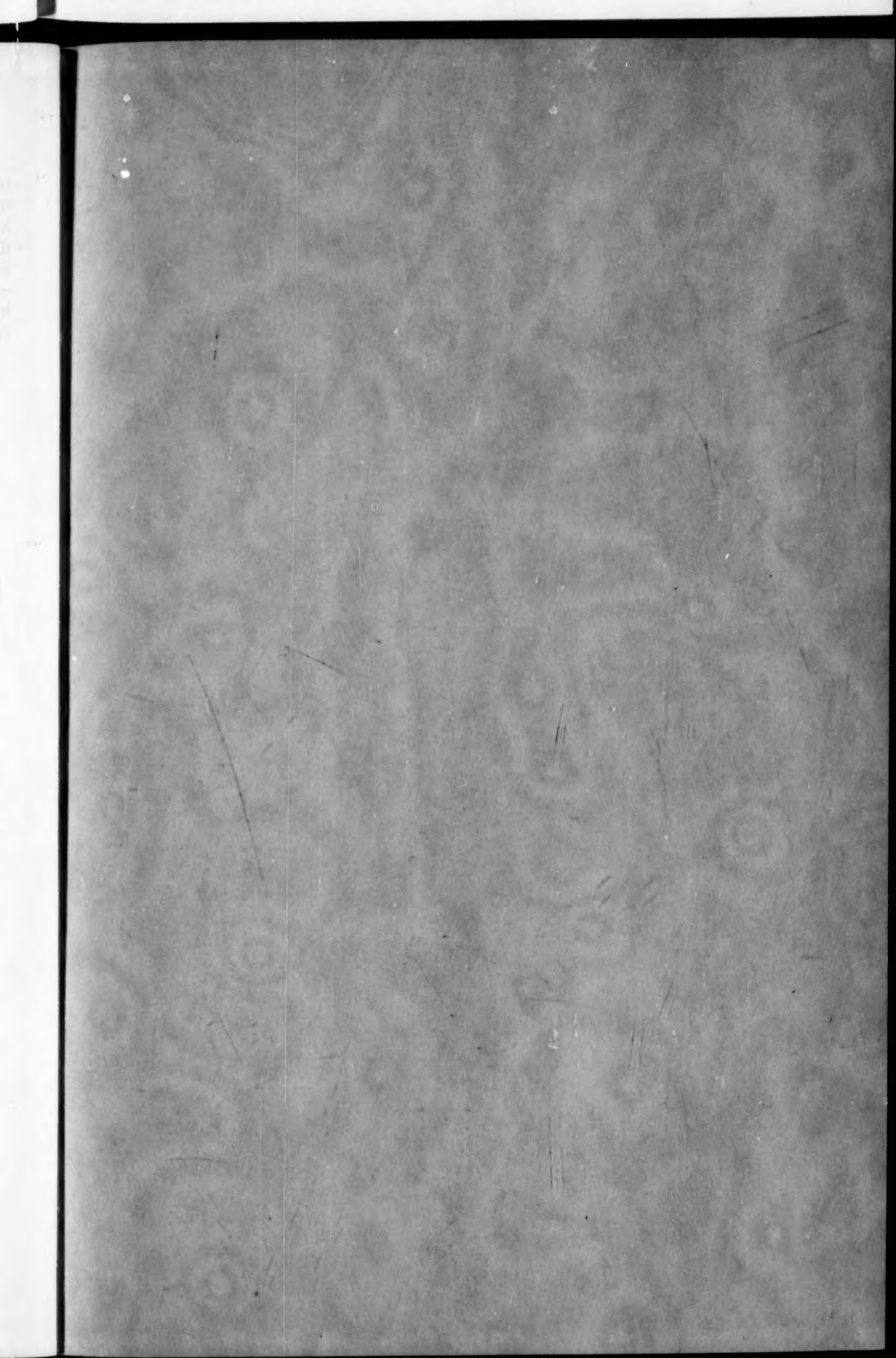
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- Psychoanalytic Review**—New York, N. Y.; 64 West 56th St. Subscription \$6.00. 500 pages annually. Edited by Smith Ely Jelliffe. Quarterly. Founded 1913.
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- Journal of Applied Psychology**—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription \$6.00. 480 pages annually. Edited by Donald G. Paterson. Bi-monthly. Founded 1917.
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- Character and Personality**—Durham, N. C.; Duke University Press. Subscription \$3.00. 360 pages annually. Edited by Karl Zeigler. Quarterly. Founded 1932.
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